# PACKAGE engineering

## Factors governing aerosol container selection

Choosing the right aerosol container for a given product involves checking materials, sizes, capacities and coatings in regard to such factors as corrosion, container cost and shipping weight. (See Page 9)

## "Tailored" packaging line for bolts and nuts

Using automatic carton forming equipment, air transfer chutes, specially-built hoppers, and plant-designed work stations—to package nuts and bolts in accord with latest industry standards. (See Page 13)

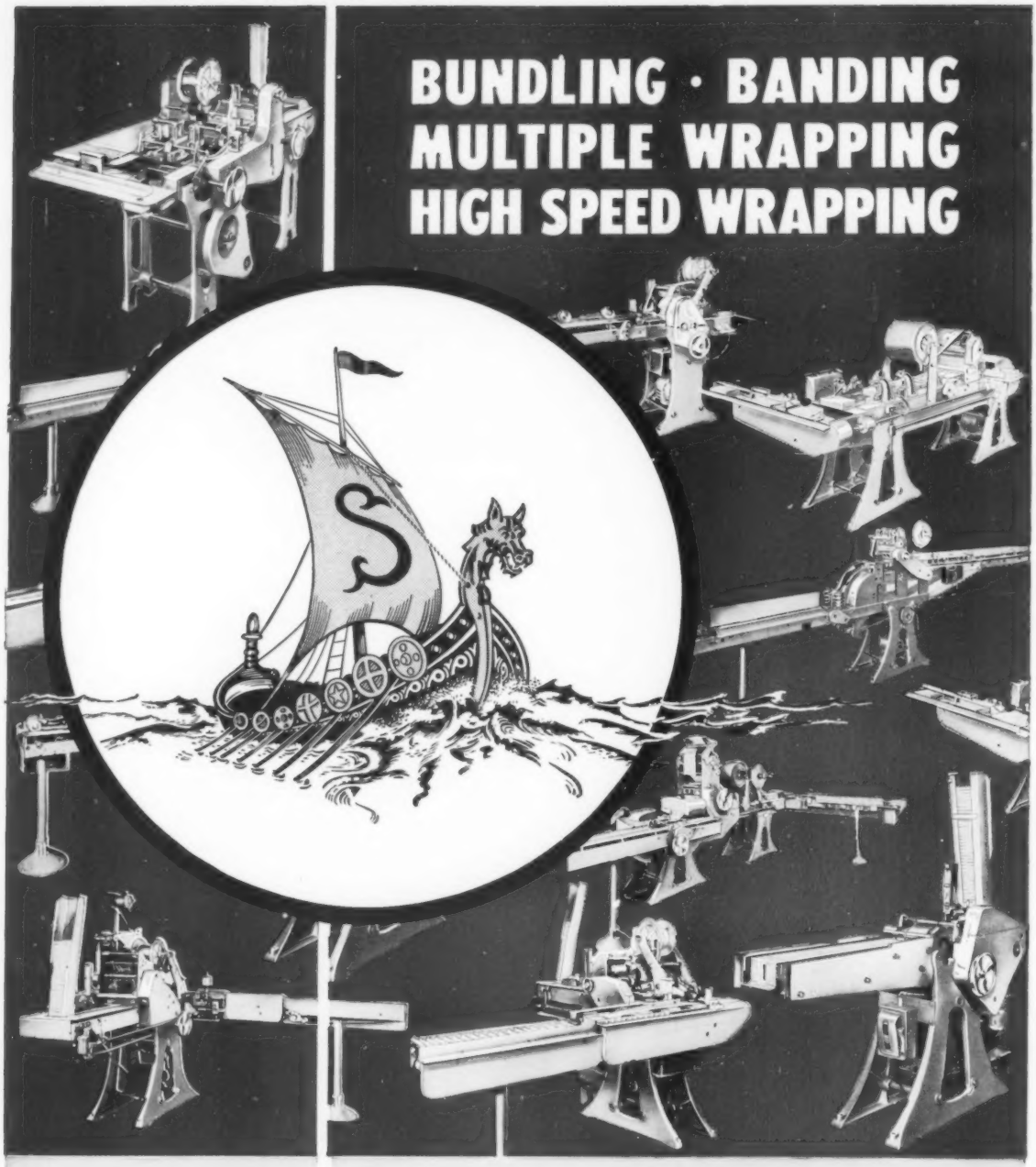
## Working with consultants helps your progress

A packaging man has much to gain and nothing to lose by working cooperatively with a consultant whom his company retains, and he usually finds the consultant's special knowledge of real value. (See Page 22)

**Complete table of contents on page 2**

**MARCH 1956**

VOLUME 1 • NUMBER 3

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# Aluminum Foil Packaging as a Moisture Vapor Barrier

*Report No. 2 of a Series by Reynolds Metals Company*

Laboratory tests in great number have proved the low moisture vapor transmission rate of aluminum foil itself and of foil in combination with other materials. More interesting, however, is the case history of a product exceptionally susceptible to damage by moisture, with test results of different packaging materials.

The subject chosen is one of the new chlorine-bearing detergents, now increasingly popular. Specifically, it is a national brand product submitted by the manufacturer to Reynolds Research and Development Laboratory at Richmond, Virginia, for testing.

Chlorine-bearing detergents depend for their effectiveness on a very high degree of protection against moisture pickup. Moisture, even in very slight amount, reacts with the detergent to release the chlorine. Moisture vapor transmitted through certain types of packaging can readily cause this deterioration.

The charts and photographs on the right describe fully the results obtained. The overcoated foil overwrap was finally adopted rather than the uncoated one in order to provide additional protection for the inks and thus to prevent marring in transit and in handling.

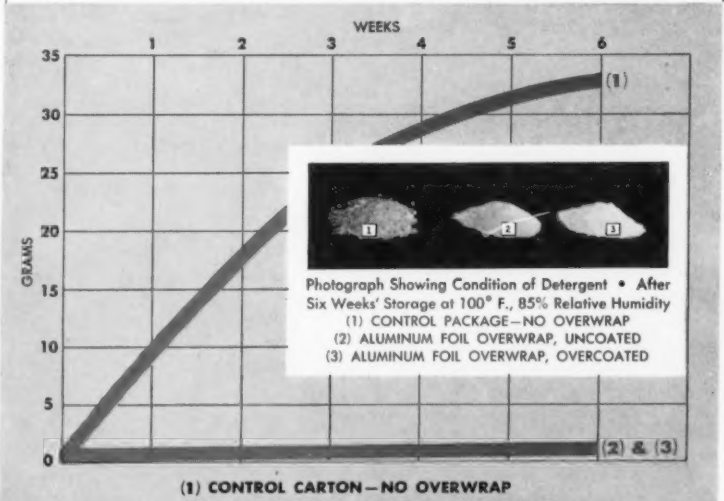
Whether your packaging problem involves moisture gain or loss, contact your Reynolds regional representative so that these Research and Development Laboratory services may be made available to you.

**PER CENT AVAILABLE CHLORINE IN DETERGENT BEFORE AND AFTER SIX WEEKS' STORAGE AT 100° F., 85% RELATIVE HUMIDITY**

| PACKAGE TYPE | WEEKS STORAGE | | | | |
|---|---|---|---|---|---|
| | INITIAL | 1 | 2 | 4 | 6 |
| (NO OVERWRAP CONTROL CARTON) | 2.31 | 1.98 | 1.98 | 0.92 | 0.91 |
| ALUMINUM FOIL OVERWRAP, UNCOATED | 2.31 | 2.25 | 2.17 | 2.02 | 1.97 |
| ALUMINUM FOIL OVERWRAP, OVERCOATED | 2.31 | 2.19 | 2.11 | 1.97 | 1.94 |

**AVERAGE WEIGHT GAIN (GRAMS) OF PACKAGES OF DETERGENT STORED FOR SIX WEEKS AT 100° F., 85% RELATIVE HUMIDITY**

| PACKAGE TYPE | WEEKS STORAGE | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| (NO OVERWRAP CONTROL CARTON) | 8.8 | 15.1 | 22.6 | 28.3 | 31.1 | 33.5 |
| ALUMINUM FOIL OVERWRAP, UNCOATED | 0.2 | 0.3 | 0.5 | 0.8 | 1.0 | 1.2 |
| ALUMINUM FOIL OVERWRAP, OVERCOATED | 0.2 | 0.4 | 0.6 | 0.9 | 1.0 | 1.1 |




Photograph Showing Condition of Detergent • After Six Weeks' Storage at 100° F., 85% Relative Humidity
(1) CONTROL PACKAGE—NO OVERWRAP
(2) ALUMINUM FOIL OVERWRAP, UNCOATED
(3) ALUMINUM FOIL OVERWRAP, OVERCOATED

**(1) CONTROL CARTON—NO OVERWRAP**
**(2) ALUMINUM FOIL OVERWRAP, UNCOATED**
**(3) ALUMINUM FOIL OVERWRAP, OVERCOATED**

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MARCH 1956 • VOLUME 1 • NUMBER 3

# PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

## Coming next month

**A**ssigning a packaging line to just one product makes possible an efficiency not otherwise attainable. John H. Heise, superintendent of the biscuit division, Robert A. Johnston Company, Milwaukee, discusses this topic in an article on his company's cracker packaging line. Mr. Heise not only makes a penetrating analysis of this line's detailed operation, but also reviews efficiencies attained and discusses problems solved in reaching this level of performance.

**J**ust what engineers and operating men go through in developing a brand new packaging line receive full discussion in an article about the new 26-ounce salt can line at the Akron, Ohio, plant of Diamond Crystal Salt Company. This unusual article has a three-dimensional approach. It presents the experience of (1) the plant management, (2) the engineering and operating group, and (3) the men who man the machines on the line.

**P**ackaging reagent chemicals, both dry and liquid, involves a number of special problems—especially where packaging lines must handle a large number of short runs. This is the experience of Fisher Scientific Company at its Fair Lawn, New Jersey, plant, which is the subject of an article in our next issue. Such matters as clean-up between runs (to assure the reagent purity necessary in such packaging) and adequate protection of personnel on the lines receive thorough treatment.

**A**lso, next month, we shall include two tickets to the forthcoming American Management Association National Packaging Exposition, as well as details of "the show" and the program of the accompanying A.M.A. packaging conference.

—R. B. H.

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*Details of setting up a system of forming and delivering to bins the 26 different carton tops and bottoms used in packaging nuts and bolts.*

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**Reader service card inside back cover**

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# A note from the Publisher

In this column in January I mentioned, hopefully, that we would like to hear from our readers. Hear, we did, and to say we were pleased at the avalanche of mail that greeted Volume 1, Number 1, would be an understatement. Within two weeks after our first issue was out, over five per cent of our readers had communicated with us. Some letters were from old friends in the industry, but mostly they were from men we don't know personally—letters from individuals wanting reprints of articles, or giving suggestions for future subjects to be covered editorially—but all from men concerned with package engineering who were pleased to see a magazine devoted exclusively to their interests.

While space does not permit listing more than a few comments, you may be interested in reading typical quotes from the letters we received:

J. G. Brown,
*The Quaker Maid Co.*
"We have noted with interest the first issue of your new magazine which we believe will be of real value to engineers dealing with packaging problems."

George D. Harrison,
*The Mennen Co.*
"Congratulations! The issue is a concentration of good material on a simple, down-to-earth level. . . ."

R. J. Steslicki,
*Mercury Div., Ford Motor Co.*
"I would like to congratulate you on the first edition of Package Engineering. . . ."

F. Leslie Toof,
*Rap-in-wax*
"Congratulations on your first issue of Package Engineering. . . ."

L. B. Kelly,
*Solvit Chemical Co., Inc.*
"We have received one copy of your magazine. You are to be complimented. It is a worthwhile production."

Gerhart Schild,
*Wyler & Co.*
". . .I wish to add my sincere congratulations to those you are bound to receive from all over the country. . . ."

Hall Stewart,
*Prairie States Oil & Grease*
"We would very much appreciate your sending a copy of Package Engineering to the following production supervisory personnel in our various plants. . . ."

Lack of time does not permit answering all of your letters, but we deeply appreciate your comments, compliments, and criticisms. In fact, we have adopted one suggestion in this issue. . . .the placement of the reader service card inside the back cover so that it does not break up the editorial pages. We think this change, slight as it is, will make Package Engineering more readable.

Our sincere thanks to all of you for your interest, and we hope you will continue to let us hear from you.

Angus J. Ray
Publisher


PACKAGE engineering

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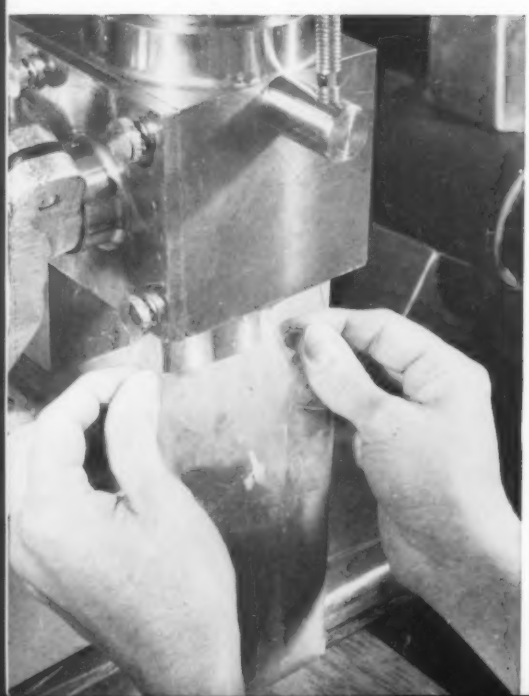

"Moreover, the polyethylene film retains our fresh-frozen clam chowder without affecting the taste or purity," asserts James L. Richards, II, president, Vineyard Island Products, Inc., Martha's Vineyard, Mass. "It makes it easy for the housewife to prepare and serve, too.

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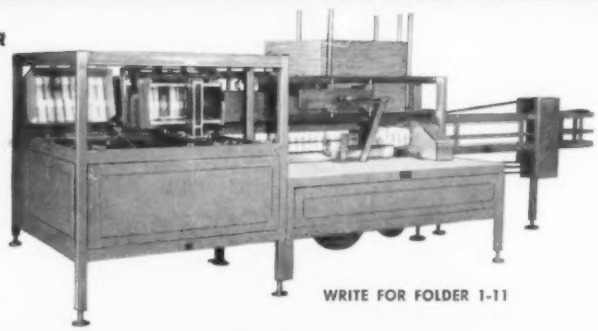

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**Morris J. Root** has been associated with G. Barr & Company for two and a half years. He was previously assistant technical director of Rayette, Inc., St. Paul, having been associated with that firm ten years. He holds bachelor's and master's degrees in chemical engineering from University of Minnesota. His list of prepared papers includes material presented before such groups as Society of Cosmetic Chemists; research and development section of American Drug Manufacturers Association; Chemical Specialties Manufacturers Association, and scientific section of Toilet Goods Association, Inc.

# Which aerosol container?

**By Morris J. Root,**
**Technical Director, G. Barr & Company, Chicago**

*Here is a searching examination of currently available aerosol containers, together with a critical evaluation of their suitability for particular products. In addition, Mr. Root discusses these containers in terms of selection factors such as materials, coatings, corrosion and shipping weights.*

The conversion of the heavy, grenade-like "DDT bug bomb" familiar only to the GI's of World War II, to the present day aerosol packages found on store counters everywhere, and familiar to everyone, was made possible only by the engineering and design of new packages. Perhaps the only thing the early and present day aerosols have in common is that they are both under pressure.

But even the pressure has changed in the over 200 million aerosol containers which were manufactured in 1955. When it was found that the pressures of 70 lbs./sq. inch gauge at 70 degrees F and over (used in the early insecticide sprays) were not necessary, work was immediately started on the development of light weight metal containers which could be used at pressures under 40 lbs./sq. inch gauge at 70 degrees F.

Low pressure propellents such as Freon 11, Genetron 11 (trichloromonofluoromethane) and Freon 114, Genetron 320 (dichlorotetrafluoromethane) were being produced, but because of government restrictions the latter propellent was not available until a few years after World War II.

Concurrent with the development in light weight metal aerosol containers was the development in the design and production of aerosol valves which could surpass the performance of the earlier valves even at the lower pressures. This development has continued; today, it is possible to make satisfactory spray products at pressures even under 15 lbs./sq. inch gauge at 70 degrees F. It was this development that brought glass and plastics into the aerosol packaging picture.

### Tinplate Widely Used

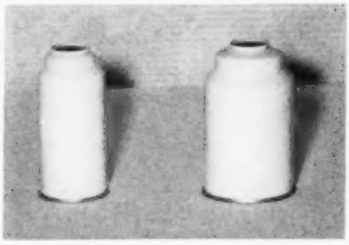
Tinplate aerosol containers far outnumber the other containers available for aerosol products. These containers are available with or without an inside lacquer coating. The tinplate is available in standard weights of .25 lb., .50 lb. and 1.00 lb. electroplate. On special order other weights of electroplate as well as hot dip plate are available.

The figure "lb. electroplate" represents the weight of tin on a base box which is 112 sheets 20 inches by 14 inches. This represents an area of 31,360 square inches, or a coated area of 62,720 square inches. Coating weights on tinplate are therefore expressed as pounds of tin per base box.

Inside lacquer coatings are chosen for their chemical resistance, and materials used include the phenolics and epoxies. Attempts have been made to use polymonochlorotrifluoroethylene (Kel-F) for internal coatings of aerosol cans because of its exceptional chemical resistance.

Since the difficulties in applying this material as a coating have not as yet been overcome, such cans have not been made available commercially. To avoid pinholes in the lacquer coatings, double coatings are usually applied to the sides, and triple coatings may be applied to the bottoms.

**1. Continental Can Company** produces these aerosol containers. Their capacities range from 4.7 to 17.6 fluid ounces. All of Continental's aerosol cans are now made with an outside side seam.



**2. Crown Cork & Seal Company** produces these two cans, which are of six-ounce and twelve-ounce capacity. These are two-piece cans, with bodies formed by drawing, and bottoms are seamed to bodies.

**3. American Can Company** produces these cans, with bottoms either flat or concave. Lugs on soldered side seams are on the inside of cans. Some concave bottom cans have flat portions to aid stacking.

## Can Size Details

Can sizes are specified in accordance with the diameter and height of the cylindrical portion of the can; thus, a 211 x 604 indicates that the can is 2 11/16 inches in diameter and 6 4/16 inches in height. Usually a volumetric capacity is designated along with the dimensions of the can.

However, the weight capacity of the can depends upon the specific gravity of the material to be packaged. Because of the high specific gravity of the propellents (1.32 — 1.48 grams per cc. at 70 degrees F), aerosol spray products are always heavier than water. This is not true, however, with foam products which have a relatively small amount of propellent (10 per cent) compared to the spray products (50 per cent or over).

Tinplate aerosol cans are available from three major can manufacturers, Continental Can Company, Crown Cork & Seal Company, Inc. and American Can Company. The standard can has a one-inch bead opening in the top, to which a one-inch valve cup can be crimped.

The following sizes of aerosol cans are available from Continental Can Company (Photo 1):

| Size | Dimension | Fluid Ounces |
|---|---|---|
| 16 oz. Dome | 211 x 604 | 17.6 |
| 16 oz. Dome | 211 x 510 | 16.0 |
| 12 oz. Dome | 211 x 413 | 13.8 |
| 12 oz. Concave | 211 x 413 | 11.8 |
| 6 oz. Dome | 202 x 314 | 6.6 |
| 6 oz. Concave | 202 x 314 | 5.9 |
| 6 oz. Dome Tall | 202 x 406 | 7.6 |
| 3 oz. Dome | 202 x 214 | 4.7 |

The capacities as shown are determined from the bottom to the valve plug in the top of the can. This measured capacity does not allow for any head space.

## Details And Seams

These containers are available in tinplate weights from .25 lb. to 1.00 lb. with or without a resin coating. These are three-piece cans, top, bottom and side, soldered along the edge. On coated cans an extra side stripe of resin is placed along the seam for increased protection. These containers cannot be lithographed all around because of the side solder seam.

Although from an appearance standpoint cans made with the lugs on the inside are better, it has been found that outside lugs give improved corrosion resistance. The lug side retains more of the solder, and it has been found that solder on the inside of the can will increase the container's susceptibility to corrosion. All of Continental's aerosol cans are now made with an outside side seam.

Crown Cork & Seal Company's Can Division now manufactures two aerosol containers, a 6-oz. and a 12-oz. size (Spra-Trainers) which are available in lacquered blackplate (cold rolled steel), lacquered tinplate, or plain tinplate. The tinplate is available in the standard range of .25 to 1.00 lb. electroplate, as well as hot dip plate, if necessary. (Photo 2):

Spra-Tainers are available in two types, the standard type which is guaranteed to withstand 125 pounds per square inch gauge (p.s.i.g.) at 70 degrees F. instantaneous air pressure without leakage or deformation, and the I.C.C. specification 2 P which must withstand not only 180 p.s.i.g. instantaneous air pressure without leakage or deformation, but also 210 p.s.i.g. instantaneous air pressure without bursting. The containers and their dimensions are as follows

| Size | Dimensions | Fluid Ounces |
|---|---|---|
| 6 oz. Dome | 202 x 411 | 7.3 |
| 12 oz. Dome | 214 x 411 | 12.6 |

Capacity measurements taken are to the top of the container.

## Choices To Make

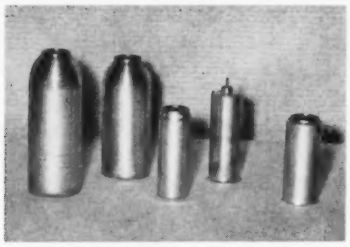
The blackplate lacquered container can be used for such non-aqueous products as insecticides, paints, solvent base waxes, etc. For aqueous products such as shaving creams, hand creams, etc., the tinplate with a lacquer coating is used. Tinplate without an interior coating can be used when special product requirements indicate this specification. The Crown can is a two-piece can, the body being formed by a drawing operation and a concave bottom affixed by seaming. Since there is no solder seam on this can, it is possible to apply overall lithography.

In the near future, Crown Cork & Seal Company will have a three-piece fabricated can available with a cone or dome top, one-inch opening, 211 x 413 size. This will be available coated or uncoated in the standard tinplate ranges.

American Can Company also manufactures a fabricated three-piece side seam soldered can in the following sizes (Photo 3):

| Size | Dimensions | Fluid Ounces |
|---|---|---|
| 6 oz. Dome Top, center button | 202 x 214 | 4.5 |
| 6 oz. Dome | 202 x 314 | 7.3 |
| 6 oz. Dome | 202 x 406 | 8.2 |
| 12 oz. Dome | 211 x 413 | 14.1 |
| 12 oz. Dome | 211 x 604 | 18.1 |

The bottom of the can is either concave or flat. A flat portion on some of the concave bottom cans makes shelf stacking of the containers pos-



**4. These American-made** aluminum aerosol containers are produced by three different collapsible tube manufacturers, using 2 S aluminum for drawing. Capacities are 2.5 and 2.8 fluid ounces.

**5. These plastic containers** might be regarded as still in the experimental stage, although such packages are reaching store shelves. Several manufacturers are doing much testing of these packages.

**6. Glass containers** available for aerosol packaging include two groups: At right at the plastic-coated glass containers and at left, those of plain glass. Plastic coatings may be translucent or opaque. Uncoated glass bottles are used chiefly for such products as colognes.

sible. The top of the can is made with a standard one-inch opening, and also in a concave or dome style to accommodate a staked-in valve. The dome top is made with or without a center button.

These cans can be furnished plain or with a single or double lacquer coating. The lugs on the soldered side seam are on the inside of the can.

### Using Aluminum Cans

Aluminum cans have been available for aerosol use from three different manufacturers, all fabricated from 2 S aluminum by drawing. (see Photo 4). Larger capacities such as 6 oz. and over are under development in this country, and have been manufactured in Germany and Italy. These larger aluminum containers have been used in foreign countries for products such as shaving creams. Their use has been dictated, however, by the lack of tinplate cans in these countries. Some of these larger size drawn aluminum cans are made with a seamed steelplate bottom.

The American-made aluminum cans that are available include the following:

| Size | Dimensions | Fluid Ounces | Manufacturer |
|---|---|---|---|
| 2½ oz. | 108 x 308 | 2.8 | White Metal Mfg. Co. |
| 2½ oz. | 106 x 313 | 2.5 | Peerless Tube Co. |
| 2½ oz. | 106 x 313 | 2.5 | Sun Tube Corp. |

These containers can be made in larger diameters and longer lengths. Capacities shown are to the top of the container.

The container which has been available longest is the one manufactured by Sun Tube. This is a two-piece drawn container with the valve crimped into the body. The bottom is seamed on after the container is filled.

The aluminum aerosol container manufactured by White Metal is also a two-piece container, but it has a standard one-inch opening at the top. The bottom is seamed and sealed with an epoxy resin by the manufacturer. Any aerosol valve with a standard one-inch cup can be used with this container.

The latest of the three containers to become available is the one manufactured by Peerless Tube, which is a one-piece container. The top is rolled over in a bead to accept a standard valve with a one-inch cup.

### Glass And Plastics

Glass containers available for aerosol packaging include the plain glass and the plastic-coated glass. (Photo 5).

The uncoated glass aerosol bottles have been marketed in limited quantities, chiefly with colognes. These are manufactured by Wheaton Glass Company, Foster-Forbes Glass Company, and Brockway Glass Company, Inc. Plastic-coated glass aerosol products have now been marketed to the extent of a few million packages in 1955. These containers are manufactured by Wheaton Glass Company and are available in sizes from 10 grams to 6 ounces. The plastic used as a protective coating for the glass can be obtained in transluscent or opaque colors.

Plastic aerosol containers might still be considered in the experimental stage, although a few such packages have reached the store shelves. (Photo 6). A 2-oz. and 4-oz. Nylon container marketed by Precision Valve Corporation has had considerable testing, but is not yet in production. Colt's Manufacturing Company has a 1½-oz Melamine-formaldehyde container now being marketed with a cologne. Owens-Illinois Glass Company is testing an aerosol phenol-formaldehyde container. A polyethylene container is also in the developmental stage. The plastic container, while having the advantage of the corrosion resistance of glass, does not have the disadvantage of shattering when broken.

### Factors Governing Container Choice

There are several things that must be taken into consideration when determining which aerosol container to use. Before choosing tinplate, blackplate, aluminum, glass, plastic-coated glass, or plastic, the following determining factors must be checked:

### Corrosion

Tinplate containers can be ruled out on products which are corrosive to tin. Where tin is contra-indicated, it is possible to use lacquered black iron, which is now available only in Crown Cork & Seal cans. Certain products will react differently with a

drawn tinplate can, and with a formed tinplate can. Corrosion characteristics must, therefore, be checked with each type of tinplate container that differs in its method of fabrication. Hair lacquers containing shellac, for example, have been found to be more corrosive to a coated drawn tinplate container than to an uncoated formed tinplate container.

With aluminum containers, anhydrous alcohol cannot be used. Propellents which hydrolize in the presence of small amounts of water to give chloride ions should also not be used. Chlorides are vigorous in their attack on aluminum.

Oily non-aqueous products such as aerosol insect repellants, suntan lotions, etc. can be packaged in an aluminum container if the propellent is Freon 12, Genetron 12 and/or Freon 114 and Genetron 320. Each product must be checked for corrosion, however, in the particular aluminum container that is to be used, since differences in fabrication cause variations in the susceptibility to corrosion even among the aluminum containers.

Plastic-coated and uncoated glass containers present no corrosion problems with aerosol products, and are indicated for certain pharmaceutical and cosmetic formulations which are either corrosive to metal, or in which even trace amounts of metals cannot be tolerated.

Aerosol plastic containers made from thermoplastic resins (nylon, polyethylene) are permeable, subject to swelling, and crazing. With this type container, the wall thickness largely governs these factors. Attempts have been made to reduce the permeability of polyethylene containers by coating the inside with other resins. Plastic containers made from the thermosetting resins (phenol-formaldehyde, melamine-formaldehyde) while much less permeable, and not subject to swelling and crazing, are subject to chemical dissolution when improperly cured.

### Pressure

One factor that is extremely important in aerosol packaging is the pressure in the containers. Some of the pressure restrictions are set by the Interstate Commerce Commission, whereas others are recommendations by the manufacturers of the containers. The chart below illustrates the maximum pressures recommended by the manufacture or allowable by the I.C.C. for the various containers.

The special 2 P container made by Crown Cork & Seal must be used for pressures over 40 P.S.I.G. at 70 degrees F. This container must be capable of withstanding without bursting a pressure of two times the pressure of the contents at 70 degrees F or one and one-half times the pressure of the contents at 130 degrees F, whichever is the greater. For pressures over 25 P.S.I.G. at 70 degrees F, each container filled for shipment must have been heated until contents reached a minimum temperature of 130 degrees F without evidence of leakage, distortion or other defects.

Many aerosol products, especially cosmetic, packaged in tinplate containers, have an internal pressure below 25 P.S.I.G. at 70 degrees F. The pressure region, therefore, where metal and coated glass aerosol containers can be used, overlaps.

Plastic containers, because of their relatively recent introduction, have not been regulated with regard to pressure. It is quite possible that with the thermosetting resin containers pressures in excess of 25 P.S.I.G at 70 degrees F could be satisfactorily used. The thermoplastic resin containers, however, deform easily under pressure, and therefore, pressures above 25 P.S.I.G. at 70 degrees F are not foreseeable. Plastic containers made with the new low-pressure type polyethylene are more rigid than those made with the high-pressure type polyethylene, and therefore withstand deformation under pressure better. Permeability with this new type of polyethylene is improved, but not yet satisfactory.

The possibility of breakage, with resultant flying glass, is the reason that manufacturers of uncoated glass containers recommend that pressures be kept under 15 P.S.I.G. at 70 degrees F.

Copies of the complete Interstate Commerce Commission regulations with regard to aerosol containers can be obtained by writing the Bureau of Explosives, 30 Vesey Street, New York 7, N.Y., and requesting Freight Tariff No. 9.

### Capacity

Tinplate and blackplate containers are used when four ounces, or over, are to be packaged in an aerosol. Standard metal aerosol containers which are usable up to 40 P.S.I.G. at 70 degrees F can contain no more than 17.6 fluid ounces. Aluminum, glass and plastic are generally used when less than four ounces are to be packaged in an aerosol. Foreign aluminum containers of six ounces and over are available, but have not met with much acceptance in this country.

### Cost

The tinplate and blackplate containers are the lowest priced aerosol containers available. Aluminum containers in the 2½-ounce size are slightly cheaper than comparable size plastic-coated glass containers. Plastic containers are more expensive than the plastic-coated glass, due chiefly to the high cost of the plastic material used. The recent introduction of a phenolic for a plastic aerosol container may change this situation. The

*(Continued on Page 38)*

| Maximum P.S.I.G. 70°F. | | I.C.C. Regulations |
|---|---|---|
| 90 | 2 P Crown Can<br>soaps and foodstuffs only | 73.302 (a) (5) |
| 70 | 2 P Crown Can (with safety valve)<br>propellents only | 73.306 (c) (1) |
| | Non-flammable, non-poisonous insecticides | Special Permit 1195 |
| 60 | 2 P Crown Can<br>flammable, non-poisonous products | 73.306 (d) (2) |
| 40 | Metal containers<br>blackplate, tinplate, and aluminum | 73.302 (a) (3) |
| 25 | Plastic coated glass<br>Plastic | Manufacturers' Recommendations |
| 15 | Uncoated Glass | Manufacturers' Recommendations |

*To enhance the mechanization of its packaging, the Chicago plant of Lamson & Sessions went ahead with an installation of carton forming equipment and a tailor-made air transfer system —even though ground for a new plant is already broken. In this article the plant manager describes the evolution of components of the system and reveals its operating details.*

# Machinery and air combine to get nuts and bolts into cartons

**By W. L. Dunning,**
**Factory Manager,**
**The Lamson & Sessions Company, Chicago**

**W. L. Dunning** joined Lamson & Sessions in 1929 as a laborer. As he worked through various positions, he obtained most of his education through attending evening schools and courses. Since he started working prior to finishing high school, he has largely self-educated himself, as a background for the position of factory manager which he now holds.

Three major factors governed our installation and use of our present method of packaging nuts and bolts: (1) We are following the carton and container dimensions of the Industrial Fasteners Institute; (2) in spite of very diversified production we wanted to mechanize as far as we could, and (3) we wanted a low-cost, more or less temporary packaging operation — since we are moving to a new plant, for which ground is already broken.

Starting point of our present packaging operation was the Industrial Fasteners Institute "Manual on Packing of Bolts and Nuts." With the Institute's committee on packaging spearheading the project, it has taken about seven years to standardize the packaging of our industry's products. Our company is now converting its packages to the established standards developed by this committee.

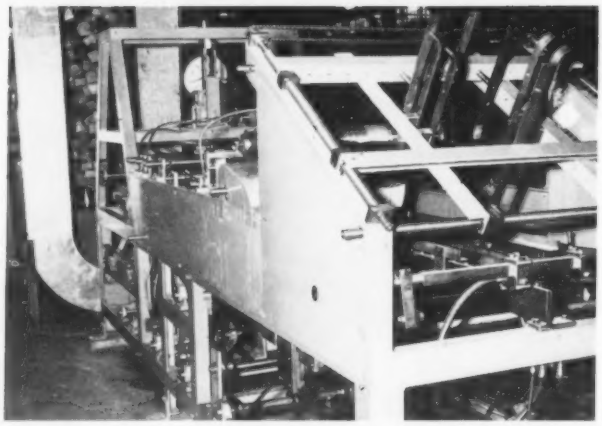
OUR OWN APPLICATION. We now use just 13 sizes of folding cartons and only three sizes of corrugated containers—into which our cartons go after being filled. With 13 cartons we thus have 26 carton members to handle, 13 tops and 13 bottoms. Our cartons are solid kraft (no filler plies) with calipers ranging from 0.026 to 0.034 inches, depending on carton size. Since the Institute specified only the dimensions and not the design, our company headquarters in Cleveland evolved our carton design.

Corrugated cases are 10-, 20- and 40-carton units. In other words, there are quarter, half and full cases. These are dimensioned so that two No. 20's or four No. 10's occupy the space of one No. 40. These packages are planned to serve stock layouts, such as used by jobbers—in accord with industry practices.

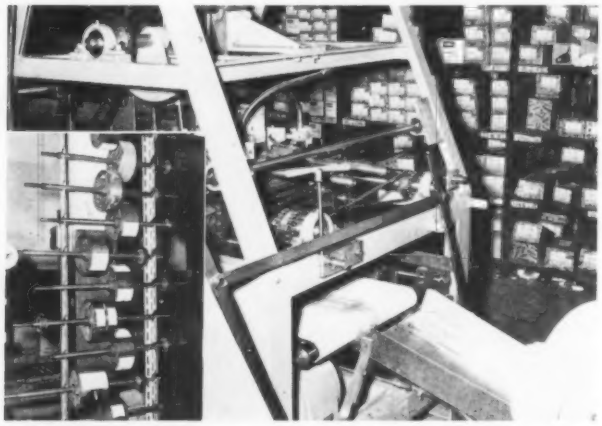
### Bins For Cartons

To furnish cartons to our packing tables we use the coordinated operation of a Meyer-Clement carton former, a Markem imprinting unit and our own system of bins for the storage of carton tops and bottoms. Since our carton former makes possible the automatic setting up and gluing of carton tops and bottoms, and since our imprinter minimizes our identification problem, our focal point at the start of our project was the handling of carton supplies.

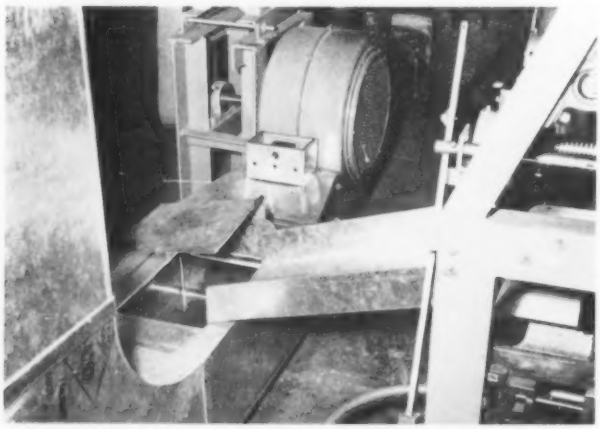
First step of this phase of the project was to make a "recap" of our carton usage in order to deter-



**This Meyer-Clement** carton former connects with an air delivery system, whose chute is visible at left. This carton former automatically forms, glues and delivers blanks, and is readily adjusted for 13 different sizes.



**From cartoner belt** the formed tops and bottoms pass to this trough—on which they move into the air delivery unit. Inset (lower left) shows set of glue spotter wheels—each for a different carton size.



**A stoker blower** whose two-h.p. motor runs at 600 r. p. m. provides the air for movement of cartons to bins. When cartons drop into the duct, air blows them upward. Motor speed of 900 r. p. m. was too fast.

mine consumption rates of our 13 cartons. We did this to find out what would be a week's supply of each carton. After getting these figures we determined the number of cubic feet of bin space necessary to hold this one-week supply of each carton member.

BIN WIDTHS DIFFER. Since we wanted bins of uniform height and depth our point of variation was the *width* of each bin. All bins are 15 feet high and three feet deep, but vary in width from two to four feet —depending on carton usage. There are 26 of these bins, 13 for carton tops and 13 for carton bottoms.

By developing bins of this capacity we need only run each carton top and bottom once a week. This avoids frequent change-over both at our imprinting equipment and at our carton former. Thus, attendants at the packing tables merely draw from our bins the tops and bottoms for a given order—regardless of how many and which of our 13 cartons are being used.

### Bin Structural Details

Our bins utilize Unistrut members for support and have fairly open wire mesh for their sides. Use of an open mesh contributes to the support of cartons—since cartons tend to catch on the mesh. This means that the bottom or lower cartons in the bin do not carry the entire load. We find this reduces or minimizes the crushing of cartons on the bottom of each bin load.

Another reason for using mesh instead of a solid material, such as wood panels, is fire protection. In case a fire occurs in a carton bin it will be easy to get at the seat of the fire as well as easy to locate the fire in the first instance. In packaging as in all our operations we give distinct consideration to fire protection problems.

HOW DOORS WORK. Running on the top of our row of bins is an enclosed wood chute. At the top of each bin and on the bottom surface of this chute is a trap door that is horizontal in closed position. When an attendant pulls a chain to open a trap door—so that cartons may

enter the bin—the door becomes a baffle.

In open position a door is held at an angle of about 45 degrees, and cartons being blown to this bin strike the door surface and are deflected downward, into the bin being loaded. Since only one bin fills at a time the carton bottoms or tops merely move down the chute (by air-blown action) until they strike the open door. Thus, they ride right over doors of other bins, which are closed.

HOLDING COST DOWN. Aside from the necessity of doing such an operation as inexpensively as possible, consistent with performance, we wanted to minimize the expense involved with this line because we are moving to a new plant in the Chicago area in the near future—as soon as this plant can be completed. Therefore, we avoided structural features that we might have used in a permanent location.

For example, we constructed our overhead horizontal chute of wood rather than of sheet metal. This involved less than a fourth of the cost of metal. Likewise, we are using doors of a temporary type at our bin bases. For a permanent installation we would use a different kind of sliding door. However, the important thing about our temporary doors is that they work effectively.

### Air Blows Cartons

To move our cartons from the carton former to the chute serving these bins we developed a blower system. We had seen somewhat similar applications of air-blown movement in other plants and became convinced that we could tailor-make such a system to fit our particular needs. We did work out this system and it works to our satisfaction.

First, we took an old blower from a stoker formerly used in our plant. This has a two-horsepower motor and runs at 600 r. p. m. We tried it first at 900 r. p. m. and found this speed unduly high. Reducing our speed to 600 r. p. m. we find it does the job properly.

USE METAL CHUTE. Our blower stands at the delivery end of our carton former. To transfer carton tops and bottoms from this delivery point to the adjoining bins we use a metal chute in connection with our blower. Because of two 90-degree turns (horizontal to vertical, for upward movement, and vertical to horizontal, for bin-chute movement) we found it impracticable to use wood.

Thus, cartons leaving the Meyer-Clement unit go into the air unit, are blown upward, then go through the horizontal overhead chute—until they strike the baffle of the open door. Then, they go into the correct bin and stay there until withdrawn by a packing line attendant. Large wire baskets facilitate transfer of cartons to the individual packing stations.

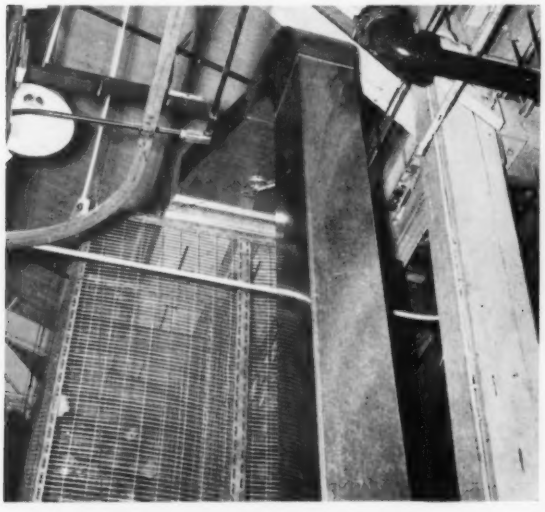
### Forming Of Cartons

Although the carton former is a standard Meyer-Clement model, it is the first machine produced for this particular type of carton. The strength inherent in the solid kraft stock requires a carton former with structural and functional members capable of handling such material. In essence, what happen is that the machine takes the flat blanks and automatically forms, glues and delivers them—to our blower.

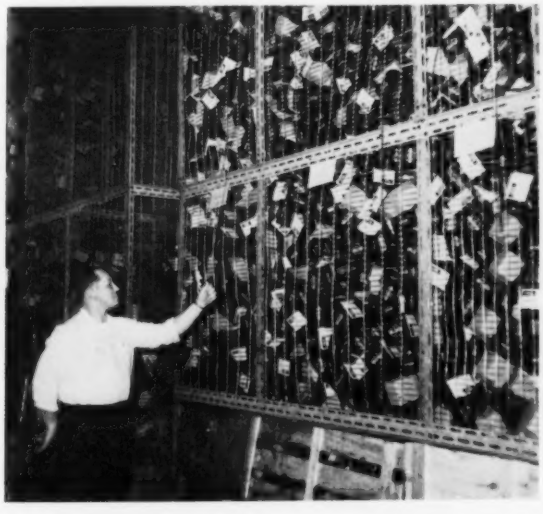
This machine breaks the scores, folds the flaps, folds the ends in, and applies glue with a spotter wheel. We have a complete set of spotter wheels—each for a different carton so that the glue application coincides with which carton we use.

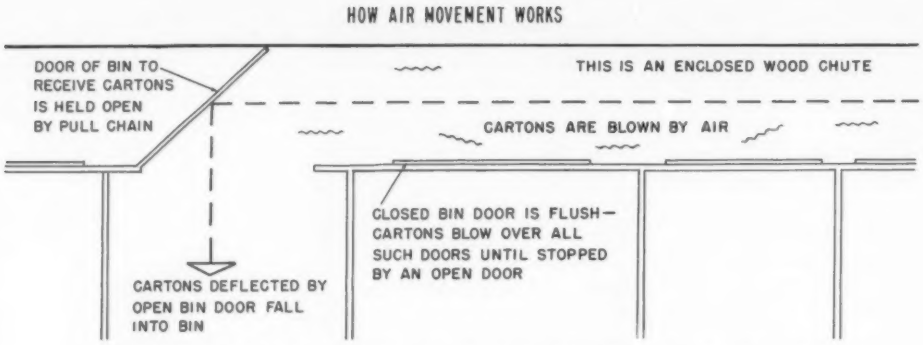
VACUUM AND AIR. There is a vacuum pick-up hopper to take the bottom carton from the hopper, to start it through the machine. A lug

**With two 90° turns** to make, it was necessary to use metal instead of wood for the chute system—even though the whole installation is temporary, pending a move to a new plant. Note mesh of bin, in background. Mesh helps support cartons.



**Pulling a chain** lifts a trap door to open position, so that air-blown cartons will strike door surface and deflect into bin. These bins vary in width because one-week supplies of different carton sizes vary, and bins were planned to coincide with carton use.




HOW AIR MOVEMENT WORKS
DOOR OF BIN TO RECEIVE CARTONS IS HELD OPEN BY PULL CHAIN
THIS IS AN ENCLOSED WOOD CHUTE
CARTONS ARE BLOWN BY AIR
CLOSED BIN DOOR IS FLUSH— CARTONS BLOW OVER ALL SUCH DOORS UNTIL STOPPED BY AN OPEN DOOR
CARTONS DEFLECTED BY OPEN BIN DOOR FALL INTO BIN

**When trap door** is held open at this angle, the cartons being blown down the chute strike the open door and deflect down into their bin. Other bin doors rest in flush, closed position—so cartons pass over them. A simple chain movement from floor controls opening and closing of bin doors, as needed for carton delivery.

on a chain carries each carton through the glue application, after which the breaking and closing action takes place. There are four air cylinders, which actuate to fold in the four corner flaps.

A die and plunger coordinate in the action of completing the formation of a carton, so that the ends are pushed up. To set the glue, pressure applies to both ends of each carton simultaneously. After this, each carton drops to a belt which carries it to the discharge point—and into the blower system.

### Packing Table Operation

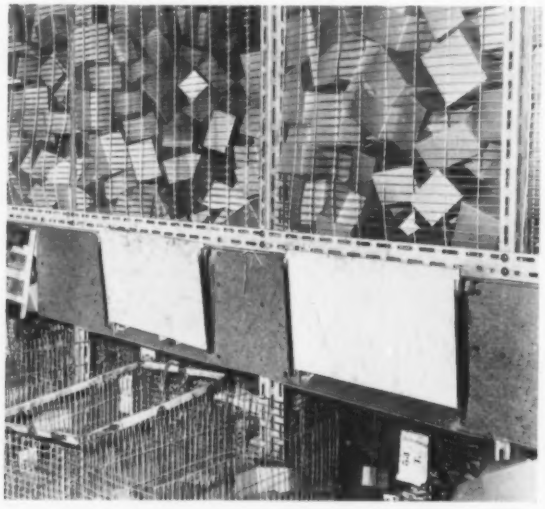
It is here that the individual cartons receive their quantities of nuts and bolts. At each packing table or station is a trunion can which is a supply container of nuts and bolts, as the case may be. An overhead crane or hoist action delivers supplies to each trunion can. Girls working at the individual stations get their products to package from the trunion can openings.

We developed our own tables, with special features such as tables and plates used in connection with our checkweighing. For a particular item each girl has a control sample that rests on an Exact Weight checkweighing scale. Other special features include nut tighteners located on table surfaces at work stations.

CORRUGATED CASE USAGE. Once filled, individual folding cartons are closed, then go into corrugated cases. We use these because they can take more abuse than wood, have less tare weight, and represent a 50 per cent cost saving for us.

After receiving their fill of loaded cartons of our products, these cases move out of the packaging area on a conveyor. If cases are to fill live orders they are immediately stenciled and moved to the shipping floor. Otherwise, they go into finished stock, available for order filling as needed.

**These sliding doors** facilitate loading of baskets with cartons. Because installation is temporary these doors provide an inexpensive, effective means of emptying contents of bins. Open mesh gives cartons support, and contribute to fire protection.



**Each packaging station** has: A trunion can (center) holding supply of items to package; checkweighing scale; packaging supplies, and rack-like table. Basket at girl's right contains empty cartons drawn from bin, for the particular items being packaged.

# PROTECTED BY RIEGEL

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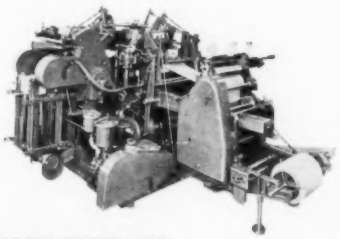

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**Prior to packaging,** these girls unload double-tier reshipper corrugated boxes, transfer empty bottles to conveyor leading to bottle filling station. Use of overhead powered conveyor delivers empty boxes to case loading point at far end of line.

**Start of packaging** operation is the feeding of Anacin tablets to this Redington bottle filler, using a Robo-Lift bucket elevating conveyor. Meanwhile, empty glassware moves in (right to left) on conveyor at right, seen below the overhead conveyor.

# Developing a high speed bottling line for Anacin tablets

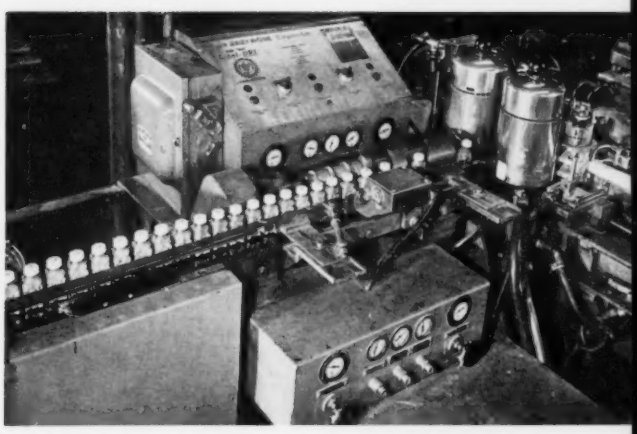
**By John W. Culligan,**
**Assistant Vice President, Whitehall Pharmacal Company, Elkhart, Indiana**

**John W. Culligan** is an alumnus of Seton Hall College and also has studied at Utah University and Philippine University. Associated with the Whitehall organization for several years, he has "the final word" on packaging and production of the company's products. He has developed the packaging and production operations to their current efficiencies.

One of the latest phases of our more or less constant packaging improvement program is our new high speed bottling line for Anacin tablets. It represents a combination of new machinery, improved manual techniques, various shortcuts and gadgets — coordinated with standard units of machinery and our own layout of conveyors and work movement.

Although we are currently operating this line at a speed of 150 bottles (of 100 tablets each) a minute, we are looking forward to still higher speeds. Further, we expect to develop more changes—even though the essential pattern of this

**Careful supervision** of bottle filling operation contributes to uniformity of packaged products. This girl is picking out broken tablets as she scrutinizes filling of all 50 chutes of this machine. Cottoner and capper are in background, at far right.



**This labeling equipment** applies two thermoplastic labels to each bottle simultaneously—one to each side. Concave surfaces of these bottles presented special problems in label application but these have been solved, and bottles now hold labels properly.

*Installation of new equipment and the use of production short cuts as well as a training program for packaging line personnel, have resulted in a bottling line notable for its high speed. In this article, Mr. Culligan reviews the development of this operation, focuses attention on factors contributing to its efficiency.*

line's operation is now clearly seen.

TRANSFER OF BOTTLES. Starting point of our line is the unloading of empty bottles. These reach the packaging area of our plant in re-shipper corrugated cases loaded on pallets. The bottles are removed from each case upside down by the girl operators who feed bottles onto the conveyor belt.

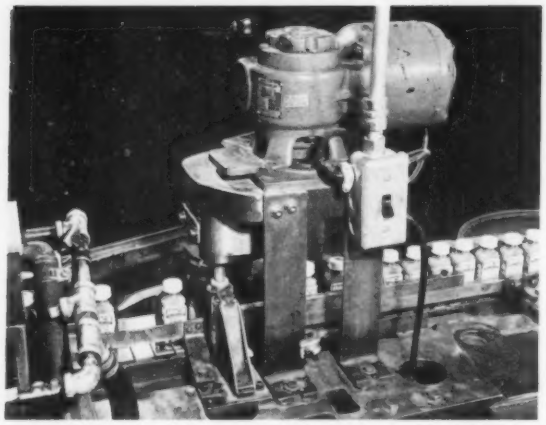
Meanwhile, supplies of our Anacin tablets reach the packaging room in coded, closed fibre pails — which are subject to close batch control, with careful accounting of identifying tickets. To supply our packaging line a line service man empties pails of tablets into a hopper.

This hopper feeds a Robo-Lift bucket elevating conveyor which in turn delivers tablets to the bottle filling machine. Our own personnel worked out this conveying and feeding system. Our object was to deliver tablets to the machine with as gentle a transfer as possible and to provide gradual feeding of the equipment.

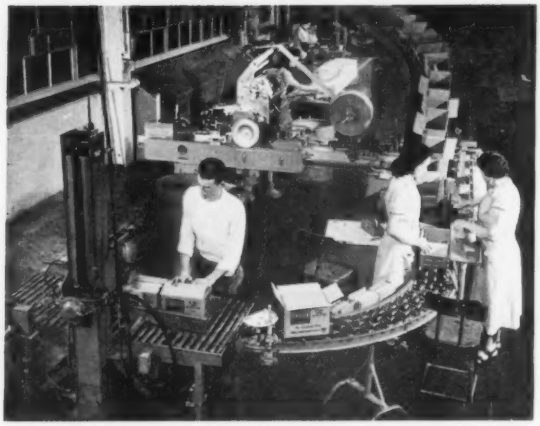
### Filling Of Bottles

Concurrently, the empty bottles arrive for filling, and move on a platform chain conveyor that is part of the intake section of our new Redington bottle filling machine. Going through a star wheel transfer timing mechanism, these bottles are spaced — and turned 90 degrees. Thus, they ride through the filling section of the machine face to face rather than end to end. This change of direction facilitates bottle filling, especially with the smaller size bottles of those we use on this line.

TABLETS GO INTO BOTTLES. Moving through this section each bottle receives its fill of tablets. There are 50 chutes through which tablets pass into bottles, with a cog-wheel at each chute to feed tablets to bottles. Each bottle receives one or two tablets from each chute (as bottles of 50 or 100 tablets, respectively, are being filled) as these bottles pass under the chutes. After bottles receive their



**Use of a "Mixmaster"** type of spinning action, with vertical cylinder movement to follow the contour of bottle surfaces proved the answer to the labeling problem. There is a brush to retard the spinning action, once it has done its work.



**End of this line** is where the finished goods go into cases, preparatory to case closing. Note use of backlog supplies after cartoning operation and prior to bundling—in background. Reshippers move in from bottle unloading point, at start of packaging line.

fill of tablets they discharge from the bottle filling machine and move by conveyor to the next operation.

Now, our filled bottles go through a Consolidated cottoning unit and a Consolidated capper. An air hose stationed near the capping equipment is available for cleaning the various machines and units in this area of our line. We have installed a specially built extra hopper on our capper. This lets one man serve the entire first half of our line by minimizing the time he spends supplying caps for the capper.

### Details Of Labeling

From the capper these bottles move by conveyor to a New Jersey Machine labeler, a unit that applies two thermoplastic labels at once to each bottle — one on each side. We faced a problem with the labeling of the concave surfaces of our bottle. However, the supplier of our label paper, Nashua Corporation, suggested a solution—which we are using: By providing a spinning, "Mixmaster" type of action, with a vertical cylinder to follow the surface of the bottle, we avoid the blister-like effect otherwise resulting. There is a brush to retard the spinning action. Now, we have no difficulty — even though our labels are going onto concave surfaces.

Labeled bottles move into an R. A. Jones cartoner. We had this rebuilt because our current speed requirements exceed those for which this machine was initially built. From here, cartons go through a Scandia bundling unit—which overwraps each six cartons. Next, two girls pack the wrapped bundles into corrugated cases. These cases pass a Kiwi coder, then move into an International Staple closing unit.

An overhead conveyor delivers the cases to the loading point, after receiving them at the bottle unloading station. This conveyor parallels our bottling line, delivering the empty reshippers at the point where they are re-packed.

We find it helpful to use backlogs at various points on our line. First, there is a gravity conveyor at the start of the line, holding supplies of reshipper cases of empty bottles. There is next a reserve point of capped bottles — in front of the conveyor leading from the capper to the labeler. Another backlog or reserve stands just after the cartoner — holding a supply of bottles in cartons.

### Use Of Personnel

Our current personnel for this packaging line includes:

2 girls feeding bottles to the filler.
1 girl attending the bottle filling machine.
1 girl at the cottoner.
1 girl handling the capper and its backlog supply of capped bottles.
1 labeler operator.
1 cartoner operator.
1 collection-point girl at the bundler (the bundler operator).
2 girls packing bundles into cases.
1 man servicing the front half of our line.
1 man loading pallets, servicing the rear half of our line and maintaining supplies such as bundling paper, cartons, et al.

EDUCATING WORKERS. An important phase of our development of this line was the training of our personnel. We not only had to train them for the present high speed operation but also we had to sell them on its advantages and features, and had to arouse their interest in its successful operation. As we normally do, we told them in advance of the coming of our new equipment, and told them just how the line would operate.

Just as we are looking forward to higher speeds on this line, we are looking forward to innovations in its equipment. For example, we are planning a new system of flow of tablets to the bottle filling machine — utilizing an exhaust means. Further, we are working on ways of speeding up our present labeling operation. These are indicative of our program of constant review and improvement of our packaging line operations.

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**Halden L. Lewis** is now engaged in the organization, development and operation of his company's staff packaging engineering department. Before joining Corning Glass Works five years ago he held executive positions in mechanical production liaison, plant layout and quality control engineering. He attended Lowell Institute, M. I. T. and Wentworth Institute. He is a member of Packaging Institute and SIPMHE and is an associate member of Sigma Xi and New York State Society of Professional Engineers. He is a visiting lecturer of Purdue University's Institute for Packaging Personnel.

# You need not fear the coming of Mr. Packaging Consultant

**By Halden L. Lewis**
**Corning Glass Works, Corning, New York**

*Here is a candid review of what goes on in a packaging man's mind when he hears a consultant is coming—as well as a comforting analysis of what really happens when the consultant does come. It represents the seasoned reflections of a lifetime of experience—revealed by a man who has been through it all and knows whereof he speaks.*

Listen to the Boss: He is telling you the decision has been made to call in a consultant to aid you in your packaging work. You are assured you have been doing a good job but. . . .

Your management is uncertain about what is the best packaging department organization and how best to integrate this organization into the over-all company structure. It is also uncertain about what is the best approach to most of the outstanding packaging problems. It feels it needs the counseling of an expert against whose opinions it not only can check its present packaging methods, but also evaluate its future planning. It recognizes its executives are not specialists in the packaging field and wants to be assured it is proceeding in the right direction or have some well-founded modification recommended to it.

With this announcement comes that sinking feeling. Your diaphragm tightens up, your throat becomes dry and your mind becomes a hodgepodge of thought and emotion.

REASONS FOR HIS COMING. You listen to the more specific reasons given you for the move: Your work load is too great with the addition of the new packaging material specifications program . . . since the start of production on that new line, business is expanding rapidly . . . you can get a broader understanding of packaging through working with the consultant, thus enhancing your value to the company . . . we want to find the best approach to the packaging of that odd-shaped high production item . . . the consultant is a recognized expert in the packaging field . . . the last analysis of our costs indicated our packaging costs were too high for that low production item . . . etc. . . . etc.

In your own mind there is question upon question: Have I failed to keep abreast of the latest packaging developments? Did we lose that last big order because of excessive packaging costs as a result of my specification of that new cushioning material? Don't they appreciate my 23 per cent reduction in the cost of materials and labor? Did I let the Boss down by not keeping him better informed on the progress of that experimental package that eventually failed?

MAKES ONE WONDER. Packaging appears to be an excellent field but am I really fitted for it? Should I be looking for a job in another company or perhaps in another field of endeavor? Am I getting the true reason for hiring the consultant or are they getting ready to transfer me to another job? Did I make the right recommendation for the

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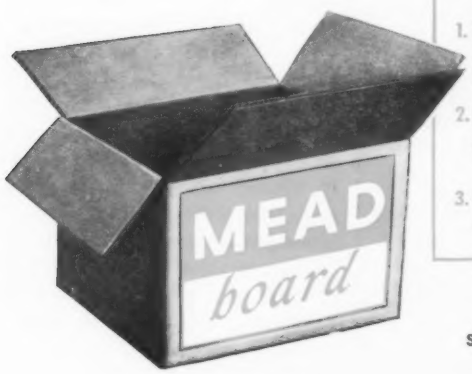


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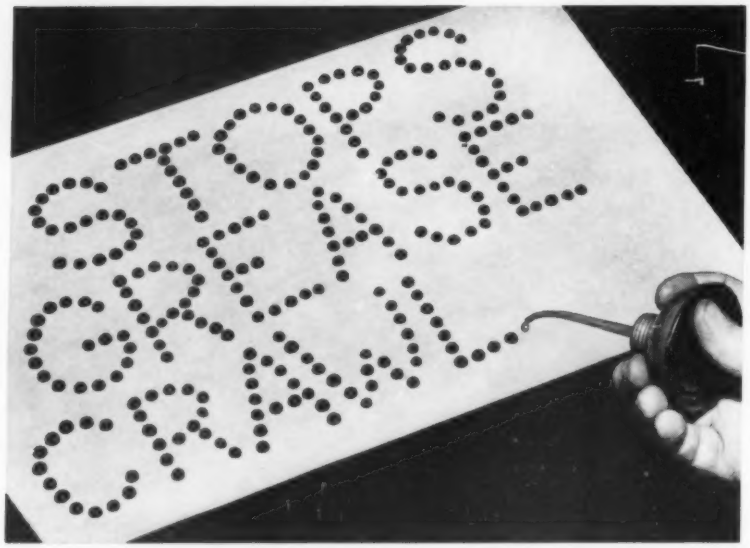

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solution of that interior packaging problem? . . . etc., etc.

To say that a person intimately involved in an area to be invaded by a newly hired consultant should not be concerned with his coming, is a waste of words. The impact of the feeling and emotion released by such an announcement cannot be lightly cast aside because it is very real to the person involved. There is, however, one very important fact to be learned from every such contact: **The entry of a consultant into your intimate field is a part of your industrial growing-up. There will be many such encounters as you advance through the field of management.**

### It Happened To Me

About 25 years ago I encountered my first consultant. At that time they were often referred to as "efficiency experts" and were usually roundly despised by most shop personnel. To my surprise my first consultant turned out to be just another human being earning his living in his chosen field. His knowledge of his chosen field was most certainly superior to mine because he had made himself a specialist.

He entered my sphere of endeavor, studied his assigned problem, made his recommendations, and retired into obscurity as far as I was concerned. I, however, learned much from his being present and, as is usual in most cases, remained with that employer for many years after that encounter.

WHAT THEY DO. While there are no hard and fast rules for the performance of the consulting function, in general it can be said that consultants observe, question, analyze, report and recommend. The final recommendation will always be greatly affected by background, experience, and ability of the individual consultant. A capable consultant will be able to cover a narrow field of endeavor in great detail because of the specialized nature of his activity.

No consultant will have, or is expected to have, the intimate knowledge of your work that you do. He may know more of the broad scien-

tific principles of operation than you do but it is not the knowledge of broad principles that makes a job successful; it is the detailed application of these principles to a multitude of day-to-day activities.

APPLYING PRINCIPLES. As a good example of this, it is common knowledge that regular slotted containers are made from a sheet of corrugated board the size of which has been determined by making the proper allowances for scoring, manufacturers joint application, flap closure. This is the broad principle. In the application of this principle there is a definite divergence of opinion as to what constitutes proper allowances. A consultant interested in the details of carton manufacture in a given plant would have to get the detailed allowances in use at that particular plant.

As in this example, the application of broad principles of operation will vary from one organization to another. The variation will depend upon many things among which are the size of the organization, the type of management applied to the work, the background and personality of the person in charge, the type of industry involved, the competitive position of the company, and many others.

### He Needs Your Help

As the consultant enters your field of endeavor he will have to make himself familiar with the way things are done by intimate contact with your day-to-day activities. In most cases he will rely on you for most of the information he needs, for this is one of the best ways for him to get what he must have. Some of his information will come from your management but even it is not as familiar with the fine details of your work as you must be.

SHOULD I RESIST? Your first instinctive thought may be to give this intruder as little help as you can. This thought can be considered a natural one, for it is quite difficult to lightly cast off the resentment brought about by the intrusion of the consultant. You may feel that if the consultant knows so much that your management prefers his opinions to yours, why should you help him at all? Why shouldn't he get his information the hard way the same as you had to?

If you permit yourself to carry such obstructive thoughts into your association with the consultant, the results will be disastrous to you. **You cannot fight the needs of your own organization and remain within it and neither can you fight industrial progress which is based on continuous change. Enter into the work of the consultant and give him all the help you can.** You will gain a better understanding of the management problems above your level and you will be amazed at the vast amount of information you will gain through this contact.

ANALYTICAL SEARCHING. To carry out his assignment the consultant will probe into every nook and cranny of your work. He will want to know why each step is performed in the accepted manner and what would happen if this or that change was made. Your pet ideas and theories will be torn apart and examined in detail. The things you have considered and accepted as gospel truths will receive merciless scrutiny and many of them will be cast aside as being outmoded or otherwise unsatisfactory. If you will look at the activities of the consultant as another opportunity for you to further your knowledge of the packaging field, you will not be hurt in this process.

In most every case you will find the consultant pleasant and congenial. It is his job to become familiar with the details of your work and he cannot do this well if he arouses your enmity. In being pleasant and congenial he is not trying to "pump" you for information he is not entitled to get. He is temporarily in the employ of your company and is entitled to any information you have and your whole hearted support in furthering his analysis of your work.

### He, Too, Is Human

As the activity of the consultant progresses you will come to know him as an individual and you will


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realize more and more that he is just another person like yourself. He must have the same order of persistence and thoroughness that you should have in your work. His day-to-day work may differ from yours but the end result must be the same. He must reduce costs or show better ways for the performance of everyday tasks.

He will struggle with his reports just as you do with yours. In most cases his report writing will be done after his regular working day. This usually means long hours for him but this is part of the price he must pay to be recognized as a consultant. He must record his facts before they become cold and the fine details forgotten, for his work takes many long hours of analysis after he has finished his contacts with you and before he can write his final report. He must always be aware of his professional obligation to your employer.

YOU EVALUATE HIM. Unfortunately, all consultants are not equally competent. As in all other human endeavor, some are better than others. In an effort to check the soundness of their judgment, your management may be interested in your unbiased evaluation of the consultant hired to aid you in your work.

**Your evaluation of the consultant must be very carefully considered. Be sure you are right before you report your conclusions to your management. Do not under any conditions let your emotions dictate your comments, particularly if they are critical. To do so can be disastrous to you in that your management can become immediately aware of your lack of good judgment and your lack of ability to render a decision based on facts rather than upon emotion or prejudice.**

THIS IS IMPORTANT. The people that rise to the higher echelon of management are usually those who are able to judge others, not only accurately but also honestly. Do not fall into the trap of feeling you can make the consultant look silly or that you can belittle him by openly re-

ferring to some half-supported fact or making a prejudicial statement about his remarks or activities. This is an extremely dangerous approach that may result in more damage than good to you.

### Don't Be Afraid!

When Mr. Packaging Consultant does show up, remember your management is not necessarily questioning your ability or past accomplishment. Do not fear this encounter, for if it is approached with an open mind, you can only gain. Your management has not only the right but the responsibility to get the best answers to any problem it encounters. Packaging is no exception.

FINDING RIGHT PEOPLE. Perhaps the most pressing problem facing management is that of obtaining the most capable personnel. A mistake made in this area is not nearly so easy to correct as one made in the specific solution to a specific problem. Mistakes made in this area usually have to be lived with for some time.

There are many more areas where management is searching for sound guidance. This is indicated in part by the fact that the gathering of the packaging function into the structure of industrial organization is undergoing many changes. We now find some packaging organizations reporting directly to the company president while others are still orphans which have been adopted by the department which showed the greatest interest or inclination.

MUCH MATERIAL NEEDED. When we search the literature we find a sad lack of sound packaging information. Only recently has there been a real effort put into the development of a packaging handbook or manual but there is still much to be done. Where can this much needed information be found? We must go back to the engineering fundamentals that have been proved over the years by their application in other fields of endeavor.

Who knows the engineering fundamentals we are looking for? Who knows of a better carton for your product or a better packing technique or method for your production line? Do you know the answers? If you don't your management must get them from some other source and sooner or later a consultant will be considered. Even if your management feels you are doing a fine job. it may want to check your progress against an outside opinion. The question may not be, "Shall we get a consultant?", but, "Which one shall we get?"

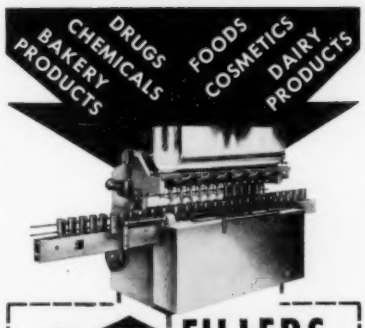
A NEW FIELD. The scientific approach to packaging is relatively new when considered in the light of such old sciences as civil or mechanical engineering. Because of the specialization attained in these and other fields, consultants have been active in them for hundreds of years.

Packaging has now become another area where management can take advantage of the counseling of a consultant. Even now there are very few bona fide packaging consultants but it is certain that time and the mounting need will correct this situation.

**When your turn comes, accept Mr. Packaging Consultant as your management's effort to get a better job done or to measure the results of your efforts against outside opinon. You will be surprised how often a consultant will report to management that its own people are doing an excellent job. To have an outside consultant say this puts a feather in your hat.**

Packaging is growing up and as it does the need for good specialists will become greater and greater. Grow up with your job and your company. Be ready to roll with the industrial punches your company must make to maintain its position. The ability to do this will always stand you well ahead of those not able to do so.

Packaging is a young industry. If you are actively engaged in it, it is your industry. It needs a mountain of development before it becomes the science it will some day. If you will strive to become outstanding in the packaging field, the time may come when you will be Mr. Packaging Consultant.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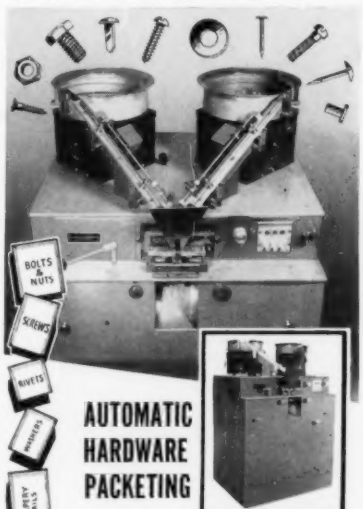


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# How Cracker Jack runs its quarter-pound marshmallow lines

By R. Bruce Holmgren,
Editor, Package Engineering

*This is what you do when you want to package a single product in one size package: Set aside certain packaging lines for it, then organize them for high speed production. The Cracker Jack Company has done just exactly that for its packaging of quarter-pound "boats" of Campfire Marshmallows. This story tells how Cracker Jack combines unusual layout and equipment positioning with the development of special techniques for its packers. Result: An accelerated operation with no time out for change-overs.*

By developing a battery of packaging lines to handle just one package and one product, The Cracker Jack Company, Chicago, is packaging its quarter-pound "boats" of Campfire Marshmallows at high speed. Focal points of this operation include (1) planning and layout of equipment for top speed operation; (2) development of special techniques and methods to use with this equipment; (3) modification of standard machinery, and (4) engineered synchronization of these elements.

FLOW OF PACKAGES. Although Cracker Jack produces different sizes of marshmallows as well as varying package sizes, it has allotted two double lines to its packaging of quarter-pound boats, each holding 16 marshmallows. There is a flow of product and packaging so that each individual line turns out these packages at a rate of 95 a minute which is the speed of bundling units. Some units run even faster: Package Machinery carton forming machines deliver cartons to each line at a rate of 104 a minute.

LAYOUT FOR ACTION. A key feature contributing to the high speed production is the *layout* of Cracker Jack's quarter-pound lines. There are two double lines. Each of these double lines has one belt conveyor carrying marshmallows and two conveyors carrying cartons. Thus, a battery of packers works on each side of the marshmallow flow. Each of these four carton loading lines has its own Package Machinery wrapping unit. These four wrappers deliver their production to a conveyor leading to two Package Machinery bundling and overwrapping units. These give inner and outer wraps to bundles of four quarter-pound packages.

SINGLE CASE PACKER. Once overwrapped, these pound bundles feed into a Standard-Knapp case packer, then into a Standard-Knapp case sealer, and from here the sealed cases pass to the shipping area on the floor below. An important feature of the case handling operation is the positioning and use of gravity roller and spiral chute conveyors. These not only give necessary compression time but also deliver cases to the correct location on the floor below.

TECHNIQUE IMPORTANT. Aside from the planning and layout features of this packaging line, another impor-

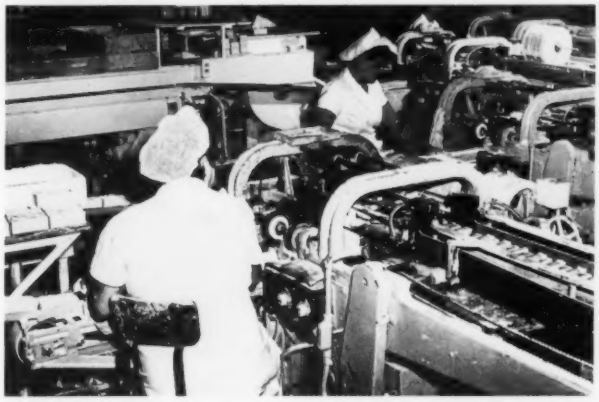
tant point is the technique which packers use in loading cartons. As marshmallows move down the belt, along the stainless steel packing table, skilled packers transfer them to cartons. It takes a girl several months to learn to pick up eight marshmallows just the right way—to get them into a carton quickly and properly. They work progressively: The first girls put the bottom eight in the cartons, after which the next girls insert the waxed glassine separators. Then, succeeding girls load the top eight marshmallows.

HANDLE WITH CARE. Due to the nature of the marshmallow itself, this job requires care. For this reason these girls follow a well-defined pattern. For example, they arrange their marshmallows into groups of eight —just before picking them up. Empty cartons move down the line in pairs —so that the carton conveyor belt on each side of the marshmallow belt is actually carrying a double line of cartons for the girls to fill. At the end of these lines and before the filled cartons go into the wrapping machinery these cartons pass the scrutiny of skilled inspectors.

WRAPPING THEM UP. Except for certain modifications by Cracker Jack's own staff, the wrapping and overwrapping machines are basically standard Package Machinery units. First, each quarter-pound carton receives an overwrap of printed waxed sulphite stock. Next, the wrapped packages automatically pass through two Package Machinery units successively, to bundle them into unit packages of four quarter-pound cartons each. The first unit applies an unprinted overwrap of waxed paper and the second gives the bundle an outer wrap of printed book paper.

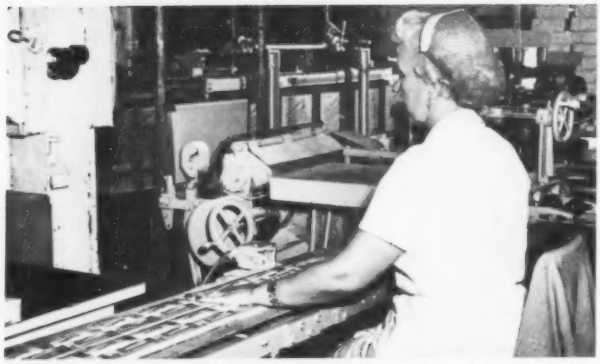
MACHINE FEATURES. The four wrapping machines that handle individual cartons are arranged in step or echelon fashion so that production of each feeds to a conveyor leading to the overwrapping equipment. Conveyors from the four machines deliver their production to the main conveyor so that rows of cartons (four wide, with cartons riding on their sides) feed into the bundling operation for overwrapping. The printed

**Chutes deliver cartons** as well as marshmallows to the packaging lines used for quarter-pound "boats" of Campfire Marshmallows. Belt in center carries marshmallows. On each side of this belt are the conveyor belts carrying empty cartons. Note that cartons pass these packers in rows two cartons wide. From the floor above carton formers deliver cartons at a rate of 104 a minute each.

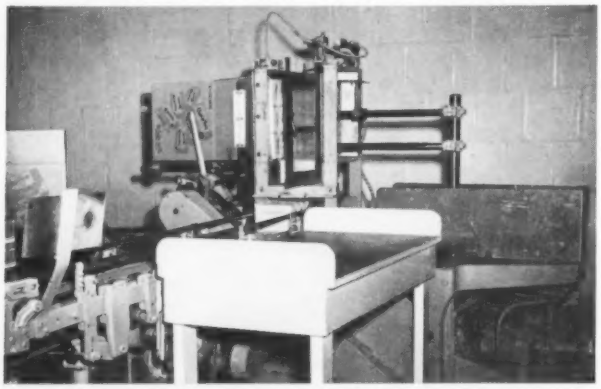


**In step-like fashion** (seen here from lower center to top right) stand four Package Machinery units which wrap individual carton "boats". These four units get their production from the two double lines used in this operation. Reason for the echelon layout is that these machines take loaded cartons from the four lines, then deliver them to conveyor carrying them (four abreast) into bundling, overwrapping unit.

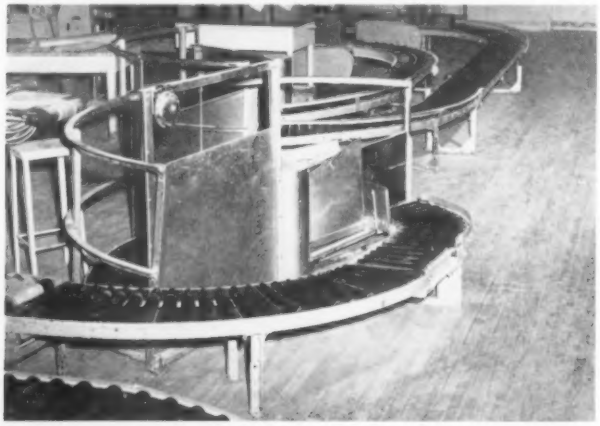
**Preparing to bundle** individual packages into unit packages of four cartons each, this conveyor carries them to the overwrapping operation. Each wrapping machine delivers its production to this conveyor. Metal guides move packages to endwise position as seen in lower right. Inspectors closely watch this operation to be sure that all packages are suitable for shipment. Each "boat" has 16 marshmallows.



**In rows of four,** these individual packages (moving left to right) go into the first of two overwrapping units. These two Package Machinery units give each four cartons (1) an unprinted overwrap of paper waxed with fully refined paraffin, then (2) a printed wrap of book paper. Packages feed directly from first machine (seen here) into second. From here, completed packages move into case loading equipment.



**Completed packages go** into this Standard-Knapp case packing machine which loads 24 one-pound packages( four quarter-pound "boats" overwrapped in each) into corrugated shipping cases. Special feature of this machine is glass window and door which Cracker Jack technicians installed. It permits case packing attendant to scrutinize loading of cases. At lower left is mirror which lets this attendant inspect packages before loading.



**Unusual arrangement** of gravity roller conveyors and spiral floor chutes does two things: (1) It assures adequate compression time for cases leaving Standard-Knapp case sealing equipment and (2) it delivers cases to central point on shipping floor below. Using this arrangement makes possible a more efficient operation on shipping floor — with minimum personnel. There are bells for communication between packaging room and shipping floor.

outer wrap is glued at its corners, with heat used to accelerate the setting of the glue.

HIGH SPEED SEALING. The heat used for this is regulated according to the speed of operation which usually is 95 a minute. Cracker Jack's own engineers added the heating equipment to the standard machines and made various changes in the equipment, such as with the folding devices. The waxed paper used for the first overwrap (to make bundles of four cartons each) is waxed in Cracker Jack's plant waxing department—using fully refined paraffin.

INSPECTION, CASING. Just before overwrapped packages go into the Standard-Knapp case packer they pass the scrutiny of a skilled inspector—who also oversees the case packing operation. A mirror at the end of the compression section of the last Package Machinery unit on the line aids the inspection task. Cracker Jack has equipped the case packer with a door and window so that the inspector can easily watch the loading of packages into each case. From here, cases make a 90-degree turn, then go through a Standard-Knapp top and bottom sealer.

CASES RIDE CHUTES. Sealed cases pass on gravity roller conveyors leading to chutes that carry them to the shipping floor below. Cracker Jack engineers had to work out an arrangement of conveyors and chutes (1) to provide enough compression time for cases and (2) to deliver the cases (through the floor chutes) at a centralized point on the shipping floor. It is important for shipping floor personnel to have these chutes deliver cases to a central point in order to permit easy disposition of cases on that floor.

STRUCTURAL FEATURES. There is a system of bells to provide easy communication between the shipping floor and packaging room floor. Although the floor chutes (with their spiral conveyors) are normally open, they are fully protected by automatic fire doors. The packaging floor itself has a controlled atmosphere: Temperature remains at about 74 degrees F at 50 per cent relative humidity.

# News of packaging personnel

R. CHESTER REED is now deputy director of the containers and packaging division of the Business and Defense Services Administration, U. S. Department of Commerce. Mr. Reed is on leave from his position as supervisor of packages and shipping, The Texas Company, New York.

New general plant manager of The Cenpro Corporation, Northfield, Illinois, contract packager, is MICHAEL GIORDAN. He was previously director of mechanical engineering of F and B Company.

MERRILL H. WEYMOUTH will become manager of The Dow Chemical Company's new Hanging Rock plant, to be opened near Ironton, Ohio, for Styrofoam production. ROBERT E. REINKER will manage Dow's new Styrofoam plant at Pevely, Missouri. Mr. Weymouth is currently superintendent of the cellulose products section of Dow's plastics production department. Mr. Reinker is economics engineer of the plastics production department.

ALFRED A. MULLIKEN is now assistant secretary of Chemical Specialties Manufacturers Association. This is a new position. Mr. Mulliken was previously sales engineer of The Creamery Package Manufacturing Company at its Philadelphia office.

Union Bag & Paper Corporation has named WILLIAM F. JACOBI director of its newly created package engineering department. Assistant director of this department is JOHN F. HORDYCH.

New sales manager of Pamco Printed Tape & Label Company, Chicago, is NORMAN STOKEN.

JAMES MAHER is now assistant sales manager of the paraffined carton division of Container Corporation of America's 35th Street plant, Chicago. Mr. Maher previously handled major accounts in the Chicago area for this division. R. W. RYAN has been named a packaging engineer of the 35th Street plant. He was previously in sales service. R. K. MCGINNIS, formerly staff assistant at this plant, is now assigned to Container Corporation's Michigan and Northwest Ohio territory, working from its Detroit office.

Head of the new Atlanta sales office of Nashua Corporation is DONALD T. CURRIE. He was previously with Mehl Manufacturing Company. ROBERT F. WHEELER is now an assistant sales manager of Nashua. He was previously sales representative of Nashua in Philadelphia.

WILBUR R. GREENWOOD JR. is now special assistant to the president of Pitney-Bowes, Inc. He assumes the duties of SIMEON W. SELLS, P-B vice president for government relations, who retires July 1. Mr. Greenwood was previously manager of special machines sales. PAUL V. ROBERTS, branch manager at Harrisburg, Pennsylvania, succeeds Mr. Greenwood in that capacity.

New president of Package Machinery Company is DONALD H. DALBECK. He continues as president and treasurer of Reed-Prentice Corporation, Worcester, Massachusetts, wholly-owned PMC subsidiary which manufactures plastic injection molding machines.

National Starch Products has appointed JOHN D. BEGGS to direct sales of its vinyl resins to paint and other protective coatings industries. He also will coordinate resin sales efforts to adhesive manufacturing and related chemical specialty fields. Mr. Beggs was previously president and director of Gelvatex Coating Corporation.

JOSEPH S. HAWKINS is now vice president of Potdevin Machine Company. He was previously sales manager of its coating machine division. In his new position he will have charge of that division's production and sales.

New plant manager of Stone Container Corporation's Eastern division at Philadelphia is SIDNEY R. BRUCE. He was previously assistant plant manager.

*(Continued on Page 34)*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Style #G-3 Seamless Flanged Can with compound lined end for hermetic sealing. Cans may be closed easily and quickly on inexpensive closing equipment furnished by us. Size Range: 1-25/64" dia. x 1-11/32" high to 4" dia. x 2 1/4" high.

Style #12 Flat Seamless Slip Cover Can. Size Range: 1/16" x 1/4" to 5 1/8" x 1 1/4".

Label/Stik Style #20 Deep Seamless Slip Cover Can. White label, crimped into cover permits marking to identify contents. Size Range: 1-3/16" x 9/16" to 4" x 2 9/16".

Label/Stik Style #10 Flat Seamless Slip Cover Can. Size Range: 1-3/16" x 3/16" to 5 1/2" x 1 1/4".

Style #22 Deep Seamless Slip Cover Can. Size Range: 1-3/16" x 9/16" to 4" x 2 9/16".

Style #G-6 Full Open Screw Top Can. Size Range: 1 1/16" x 1/2" to 4" x 2 9/16".

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# Announcements of machinery and products

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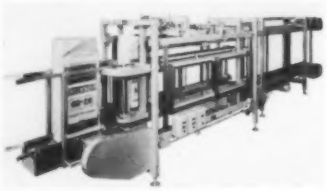
### Automatic Bale Sealer

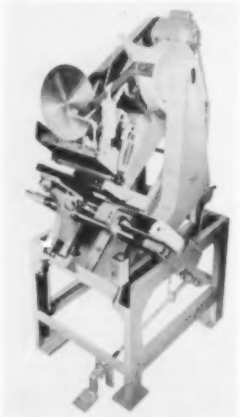
J. L. Ferguson Co. has a new automatic high speed baler, designed to handle, glue and seal paper shipping bales up



to 100 pounds each. It has a square tubular framework for maximum strength and minimum bulk. Bales feed automatically in an upright position and are timed individually into the machine. Vertically traveling pushers convey each bale through back-tucking, gluing, second folding and gluing operations. Circle No. 1.

### Semi-automatic Imprinter

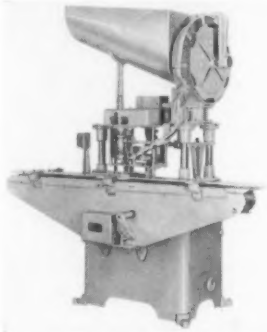
Markem Machine Co. announces its 25AF unit, a semi-automatic marking machine designed to imprint flat arti-



cles and packages. With imprint areas ranging from 2¾" by 9" to 5" by 11" this equipment makes up to 75 imprints a minute. Operation is semi-automatic, with work-piece held by drop gauge pins during the marking operation, then automatically released to a take-away conveyor. Circle No. 2.

### Single Head Screw Capper

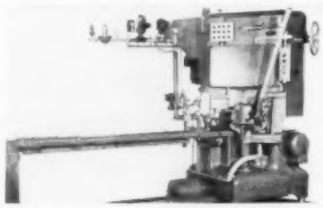
Resina Automatic Machinery Co., Inc. reports that its improved single head automatic screw capper sorts, feeds



and applies caps to bottles, jars or cans in sizes ranging from ½-ounce to two gallons. Equipped with a ½-h. p. motor, this machine runs at speeds ranging from 20 to 60 containers a minute, depending on size. Its conveyor is 6' long. Circle No. 3.

### Can Closing Machinery

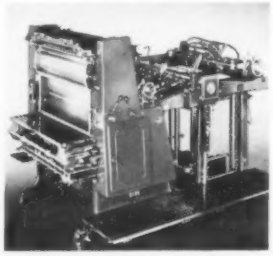
American Can Co. tells its development of three new closing machines designed to meet high speed requirements. Fast-



est of these is Canco's 212-8RG, designed to run at speeds up to 1,000 cans a minute. This is a self-contained can-revolve closing machine for double-seaming round cans. It has eight seaming units mounted in a revolving cage and handles cans ranging from 202 to 211 in diameter and 211 to 604 in height. Circle No. 4.

### Offset Press

American Type Founders announces a new high speed offset press in the 22" by 34" size range, the ATF-Mann N-135.



Capable of handling stock from onion skin to 0.028", it takes sheet sizes ranging from 11" by 15" to 23" by 36". Cylinders are mounted in phosphor bronze alloy bearings and the swing-arm mechanism is cam-controlled in both directions. ATF reports speeds up to 7,000 impressions an hour. Circle No. 5.

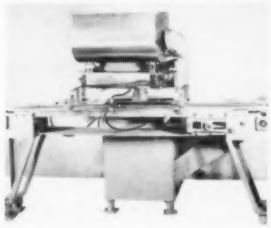
### Stabilized Boxboard

Robert Gair Co., Inc. reports development of a new type of boxboard that is stabilized to retard rancidity of fats and oils. This board is impregnated with an "invisible, tasteless, odorless chemical" which is used to reduce susceptibility of oils to development of rancidity. Circle No. 6.

### Twin Filler

The Pfaudler Co. announces its new twin filler, a two-station straight line piston filling machine, which handles

cartons, jars or cans from four ounces to gallons. Its special features include valves and pistons that may be dis-



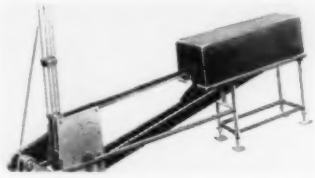
mantled without tools; no change in parts is necessary to change height or diameter of container. Circle No. 7.

**Protective Padding Fabric**

Wood Conversion Co. has a new nonwoven plain or paper-backed fabric for the protection of highly finished surfaces against abrasion, as well as shock and vibration. This material is a felt-like sheet made of various combinations of cotton, wool, cellulose and other fibers, bound together into a homogeneous mat. Circle No. 8.

**Electronic Can Sorter**

Dudley Machinery Corp. announces that its new marked can sorter separates cans (such as of different grades, coming from the same cooker) and sends the mixed cook automatically to multi-



ple labeling or casing lines. Heart of this equipment is its electronic detection of a mark, pre-applied to cans by a system which is part of this machine. Circle No. 9.

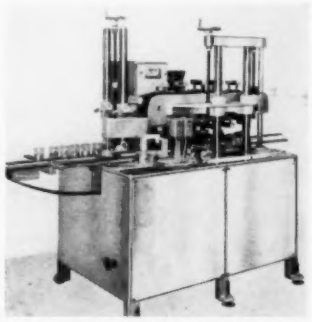
**Volumetric Filling Machine**

Frazier & Son reports development of

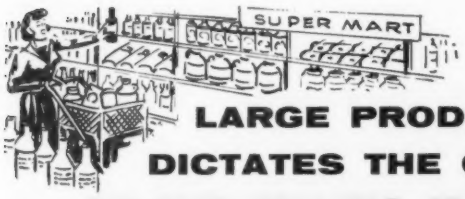
a new Whiz-Packer volumetric filler which has a vibratory horizontal feed. It is designed for products ranging from hard candy, through moth balls, to oyster crackers. It may be used as a separate volumetric unit with hopper, such as for filling powders. Circle No. 10.

**Automatic Labeling Equipment**

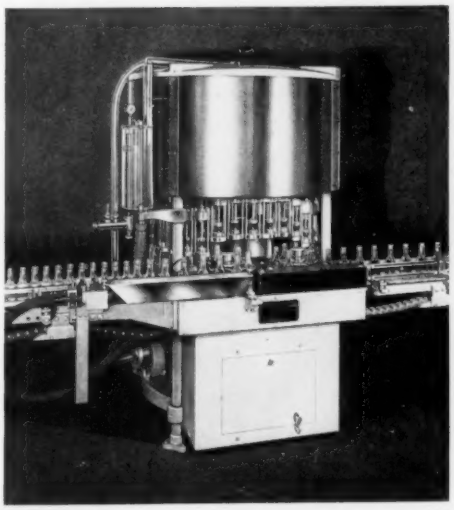
MRM Co., Inc. has a new, fully automatic labeling machine that handles not only gluing but also thermoplastic



labeling operations. It handles all sizes and shapes of containers from fractional ounces to gallons. This company


**LARGE PRODUCTION DICTATES THE CHOICE OF THE FILLING MACHINE**



For filling liquids to meet large-volume, low mark-up merchandising requirements, U.S. Rotary Vacuum Fillers are meriting first choice by the packagers of national brands.

It will pay you to learn what two generations of liquid filling engineering experience can contribute to your operation. Learn, too, how U.S. automatic liquid filling equipment can be custom-engineered to your requirements, at a substantial end saving over a standard machine.

For recommendations or quotations, please specify product, size and type of container and desired fill per minute, hour or day. For details of the machine, write for Rotary Filler Bulletin.

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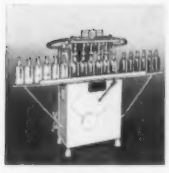
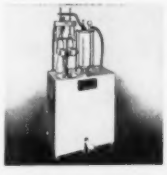


U. S. Model B-49 Straight-line Vacuum Filler; the most automatic one-man filler. Operates with or without discharge conveyor. For all types of liquids. Easy changeover for all types of containers. For full details, write for the Model No. B-49 Bulletin.



U. S. Model B-2 Semi-automatic Vacuum Filler. Provides efficient continuous production, filling two containers at a time. Automatic product supply for all containers up to 4½" dia. All liquids and semi-liquids. Portable. Write for the B-2 Bulletin.

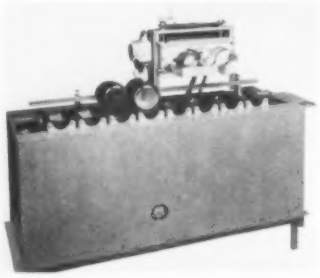
U. S. Siphon Filler. Efficient for all liquids including foamy products or products that do not permit agitation. Stainless steel tubes; acid resistant glass lined tank. Improved model. Adjustable, simple, accurate, dependable. Write for the Siphon Bulletin.

# More announcements of machinery and products

reports that the design and adjustment of this machine eliminate the need of skilled operators and maintenance service. Circle No. 11.

**Dating, Coding Machine**

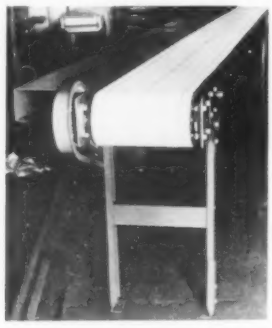
Griffin-Rutgers, Inc. announces its Codedge Mark II label dating and coding machine. This unit codes by means of



cutting a series of notches on the edge of a label, which is read with a code card. It codes not only labels but also packages such as film or foil bags, wrappers and small cartons. The company reports that it codes labels at speeds up to 2,000 a minute. Circle No. 12.

**Slide Bed Belt Conveyor**

Island Equipment Corp. announces a new light duty slide bed conveyor available in lengths of 10 to 70 feet, and



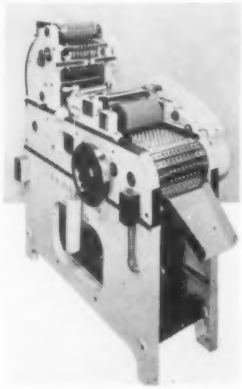
muitiples of 10 feet, with belt width from 8 to 16 inches. Belt speeds range from 25 to 50 feet a minute, powered by a ¼-h.p. motor. Available with or without side leaves or guard rails. Circle No. 13.

**Automatic Cylinder Printer**

Industrial Marking Equipment Co., Inc. has a new cylinder printer for the marking, dating or coding of cans and containers. When these containers reach the printing head they are automatically rotated as they are printed. This machine is readily adjustable for varying diameters and lengths. Circle No. 14.

**Imprinting Machinery**

R. W. Hartnett Co. reports development of a machine to imprint a name or design on pharmaceutical tablets and capsules, hard candy and the like—



using a hopper feed, prior to the items going through revolving drums to individual pockets of a belt carrying them through the printing operation. This printing process uses a combination of rotogravure and offset. Circle No. 15.

**Thermoplastic Adhesive**

Pyroxylin Products, Inc. announces a thermoplastic adhesive for attaching tear tapes to cellophane webs, in connection with various manufacturers' tear tape units. The company reports low viscosity and low operating temperatures as features of this product. Circle No. 16.

## More news of packaging personnel

*(Continued from Page 31)*

HALL RAINWATER WELLS is now sales representative in Northern California for Tee-Pak, Inc., making headquarters in San Francisco. He was previously with San Francisco Casing Company.

American Can Company named V. J. VERHUNCE superintendent of manufacture of its Central division. He was previously manager of Canco's St. Louis plant.

ALDEGE PLANTE is now resident service engineer of Economic Machinery Company, and is located at Louisville. He will cover the South Central area of the country.

New plant manager of National Can Corporation's "Kedzie" (Chicago) plant is FOLKE W. ANDERSON. He was previously assistant plant manager. ELWOOD C. BURGSTONE is now general purchasing agent of National Can, and THOMAS J. PARCHEM is now plant purchasing agent of the company's "Kedzie" plant, a position previously held by Mr. Burgstone. Mr. Parchem was previously in manufacturing and engineering work with National Can.

Cochran Foil Company, Inc. has named J. E. BOUHL and W. R. CORY product managers of the laminating and rolling divisions, respectively. Both men were previously associated with sales and related work with Cochran Foil.

L. J. LAFRENIERE is now bottle carrier service manager of Robert Gair Company, Inc. He is making his headquarters at Gair's Thames River division.

Union Bag & Paper Corporation has named C. M. CAMPBELL to handle multiwall bag sales in Minnesota and the Dakotas, with headquarters at Minneapolis. He previously handled Southeastern sales. F. M. WHITTAKER is now located at Union Bag's Chicago office, handling multiwall bag

*(Continued on Page 38)*

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### Labeling, Packaging Machinery

Chisholm-Ryder Co. of Pennsylvania has Catalog No. 1589, of its labeling machines, can casers, can unscramblers, glass cleaning lines, container feed tables, container elevators, tray invertors and case sealers. This is illustrated with close-up and detail photos. Circle No. 101.

### Stenciling, Marking Equipment

Diagraph-Bradley Industries, Inc. announces the second edition of its catalog and guide book. This not only describes this company's equipment in detail but also contains information relative to marking of shipments for both foreign and domestic destinations. Circle No. 102.

### Plunger Type Filler

Food Machinery and Chemical Corp. offers a technical data sheet on its FMC 30-pocket M & S filler, listing details such as dimensional specifications and operational and maintenance features, including a concise description of how this plunger filler for glass jars works. Circle No. 103.

### Box Forming Machinery

U. S. Automatic Box Machinery Co., Inc. has a set of bulletins on its Brightwood box machinery. These illustrated bulletins give the specifications and operating details of this equipment and shows the carton blanks which it handles. Circle No. 104.

### Glass Container Closures

Anchor Hocking Glass Corp. offers a catalog of its closures and includes with each description an enumeration of both factory and consumer advantages of the various closures listed. This bulletin also reviews Anchor Hocking sealing machinery available. Circle No. 105.

### Containers For Small Items

Lusteroid Container Co., Inc. announces a booklet that tells how to package small items, using this company's line of plastic vials and tubes. This bulletin includes illustrations of typical products thus packaged, as well as specifications of these transparent containers. Circle No. 106.

### Short Case Sealer

A-B-C Packaging Machine Corp. offers an illustrated bulletin on its short, automatic case sealer—made in eight models. This bulletin includes specifications and floor plan details applicable to this sealer. Circle No. 107.

### Automatic Packaging Machinery

Wrap-Ade Machine Co., Inc. has a set of bulletins covering its automatic unit packaging equipment and its automatic candy pop wrapping machine. These bulletins are illustrated and are accompanied by specification sheets. Circle No. 108.

### F-Style Cans

Can Division of Crown Cork & Seal Co. announces a new booklet describing its F-style cans. These use a new design that has the nozzle in the center of the top and which has bottoms with a drawn recess that registers on the nozzle of the can on which each is stacked. Circle No. 109.

### Taping Machines, Dispensers

Minnesota Mining and Manufacturing Co. has a 16-page catalog reviewing its 75 models of dispensers and taping machines. This catalog includes detailed halftones and a table of tapes which the dispensers and machines accommodate. Circle No. 110.

### Vacuum Filling Machinery

U. S. Bottlers Machinery Co. offers a bulletin covering its Model B-49 straight-line vacuum filler. This eight-page booklet includes both halftones and line drawings illustrating specific features of the operation and maintenance of this machine. Circle No. 111.

### Shipping Container Slide Rule

Robert Gair Co., Inc. offers its shipping container slide rule. This device is designed to facilitate determination and correlation of gross weight, weight of facings, size, and bursting strength—by slide rule action. It also contains government specifications for weatherproof containers. Circle No. 112.

### Wrapping Machinery

Wrap-King Corp. has a bulletin discussing its wrapping machines, including not only illustrations of its different units but also exploded views of its change-over parts and their relation to the equipment. Circle No. 113.

### Pressure-Sensitive Tapes

Industrial Tape Division of Hampton Manufacturing Co. offers a folder which includes details and actual samples of its pressure-sensitive tapes. This folder includes a description of each tape and suggested uses. Circle No. 114.

### Gluers And Sealers

Standard-Knapp Division of Emhart Mfg. Co. has a folder reviewing its gluers and sealers, including its new short hand-fed case sealer. This folder includes arrangement drawings as well as illustrations of machine models. Circle No. 115.

### High-Pressure Lubrication

Bijur Lubricating Corp. announces its Bulletin 3A, covering its high-pressure automatic lubrication system, which is illustrated with line drawings of applications, including dimensions. Details

of metered lubrication also are explained. Circle No. 116.

**Cover Capping Machinery**

Basca Manufacturing Co. has a folder describing its Fords Econ-O-Seal Synchro-Print press, which not only forms but also applies caps—of aluminum foil. It enumerates features of such closures. Circle No. 117.

**Stencil Lacquers**

New Orleans Paint and Color Co., Inc. offers a bulletin reviewing its lacquers for stenciling, including thinning instructions. Circle No. 118.

**New Auxiliary Equipment**

Horix Manufacturing Co. has a new bulletin (No. 157) describing its auxiliary equipment for the handling of bottles, jars and cans of any size. Equipment described includes glass preheaters, case unscramblers, screw type infeed timers and nine other auxiliary units. Circle No. 119.

**Tube, Jar Filling Machinery**

Arthur Colton Co. announces an eight-page catalog describing its line of filling equipment in various capacities, and ranging from hand-operated units to high-speed automatic equipment. Descriptions listed include illustrations and specifications. Circle No. 120.

**Checkweighing Equipment**

The Exact Weight Scale Co. has a bulletin on its Selectrol Checkweighing equipment, including a folder describing detailed operation of its automatic filling machine control system for use with Selectrol equipment. Circle No. 121.

**Package Sealing Equipment**

Nashua Corporation offers a bulletin containing information about its four models of tape dispensers and including data about Nashua's printed gummed tape. It includes a review of taping methods. Circle No. 122.

**Labeling Equipment**

Oliver Machinery Co. announces a bulletin on its Model 804-B package-top labeler, which uses Oliver's roll-type thermoplastic labels. This bulletin includes features and specifications. Circle No. 123.

**Multiple Can Packaging**

The Gardner Board and Carton Co. has a folder describing its Gar-pak multiple can packaging machine, a fully-automatic unit for wrapping two to six cans into a single wrap-around can pack. Details and features are reviewed. Circle No. 124.

**Gravity Filling Machinery**

W. F. & John Barnes Co. offers a bulletin on the Librascope gravity filler, for the filling of single strength juices and for syruping operations. This folder enumerates construction features and operating specifications. Circle No. 125.

**Container Testing**

Union Bag & Paper Corp. has a booklet which illustrates and describes nine different tests which shipping containers need to pass, including not only long-used but also new tests. Circle No. 126.

**Silicone Reference Guide**

Dow Corning Corp. announces its new 1956 reference guide to its silicone products. Performance charts and tabular presentations accompany the illustrations of text of this twelve-page folder. Circle No. 127.

**Plastic Containers**

The Plastics Division of Colt's Manufacturing Co. has a catalog and price sheet covering its light weight con-


**If your packages don't require dustproof sealing**

**You can cut taping time at least 2/3**

**Switch to center seam sealing with Bi-Di* or Stres-Pruf* Tape**

Center seam sealing doesn't do the same complete closure job you get with conventional 6-strip sealing. But if your product doesn't need protection from dust you'll save *plenty* with center seam sealing.

For maximum savings, specify Bi-Di, or Stres-Pruf sealing and reinforcing tape. Both are reinforced across and lengthwise. Bi-Di uses an asphaltic laminant. Stres-Pruf is non-asphaltic. Both are water resistant, and have special gumming that grabs quickly, holds permanently.

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tainers for products such as cosmetic items. Details and descriptions include a drawing of the air-insulated construction used by Colt's in the fabrication of these containers. Circle No. 128.

**Converting Machinery**

Roto Bag-Holweg Division of Conapac Machine Co. offers a filing folder style catalog reviewing its line of flexible converting machinery. There are full details and illustrations of each of the units in the company's line. Circle No. 129.

**Collapsible Tubes**

The Sheffield Tube Corp. has a 16-page booklet describing its products and services, including standard sizes and capacities, standard tube nomenclature, details of tube measurement, and types and uses of openings. Circle No. 130.

**Case Sealing Machinery**

J. L. Ferguson Co. offers a six-page folder reviewing its automatic case sealers, including detailed illustration and explanation of its high-speed Model D unit. This folder also shows representative installations. Circle No. 131.

**Dry Labeling Equipment**

New Jersey Machine Corp. has a folder describing its fully automatic dry labeling equipment, using thermoplastic labels. This folder describes dry labeling and shows with a drawing how this equipment works. Circle No. 132.

**Cellulose Bands**

E. I. Du Pont de Nemours & Co. offers a booklet which enumerates the features and uses of its Cel-O-Seal cellulose bands, including a number of illustrations of each suggested use of these bands. Circle No. 133.

**Machinery For Small Packets**

Brown Bag Filling Machine Co., Inc. has a folder describing its Formapak equipment for making and filling small packets. Detailed line drawings accompany the description of this machinery. Circle No. 134.

**Plastic Molded Boxes**

The Harmon Co., Inc. announces a


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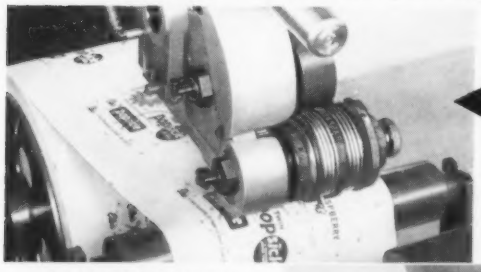
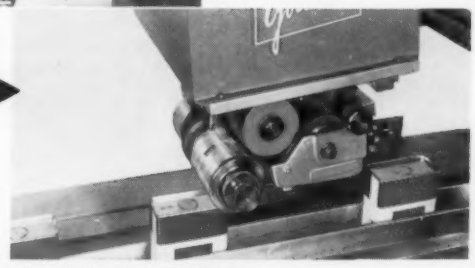


Model "700-A" ROLAPRINTER machine... compact wrapping machine attachment that imprints code-dates, flavors, weights, colors, brands, etc., on package wraps of cellophane, polyethylene, glassine, foil, paper. Makes accurately positioned imprint anywhere on wrap, adjusts for any cut-off length.

Model "700" ROLAPRINTER machine... imprints code-dates, lot numbers, product names, trade-marks, varieties, etc., on top surface of cartons, cases, round or rectangular cans and canisters. Attaches to conveyor or packaging machine. Locates imprints in exact desired position on containers even if container flow is irregular.



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bulletin and price list covering its plastic boxes and molded plastic containers. An illustrated folder accompanies this bulletin, and shows dimensions of models illustrated. Circle No. 135.

### Wrapping Machinery

Miller Wrapping & Sealing Machine Co. offers descriptive data and photos describing its Corley-Miller Kwik-Wrap equipment, including specifications and operating information of this new machinery. Circle No. 136.

### Rubber Dies And Type

Pannier Bros. Stamp Co. has an eight-page folder describing the features, use and application of rubber type and dies which it produces for case-marking, in connection with Standard-Knapp equipment. This bulletin includes facsimiles of type used. Circle No. 137.

### Net Weighing Equipment

Pneumatic Scale Corp., Ltd. offers Bulletin 122, describing its Pneumatron high speed net weighing equipment. This bulletin includes front and side elevation diagrams, as well as specifications. Circle No. 138.

## More news of packaging personnel

*(Continued from Page 34)*

sales in Iowa, part of Illinois and part of Chicago. A. J. SOHMER has moved to Union Bag's Baltimore office and will handle multiwall sales in Delaware, Maryland, Virginia and West Virginia.

New manager of packaging foil sales for Aluminum Company of America is ROBERT W. DISPENNETT. He was previously manager of Alcoa's branch sales office in Louisville. ROBERT P. GOODWIN, previously with the company's Cincinnati sales office, succeeds Mr. Dispennett as Louisville branch manager.

ROBERT C. FRANZ is now quality service supervisor of the film division of Olin Mathieson Chemical Corporation. Previously he was a film engineer of the company.

Thatcher Glass Manufacturing Company, Inc. has named REGINALD L. BURD vice president and general manager of the company's Pacific Coast division, with headquarters at Saugus, California. He was previously vice president in charge of production engineering for Thatcher.

L. A. LINVILLE is now director of Western operations of Bemis Bro. Bag Company and will make his headquarters at San Francisco. Previously assistant director of sales, Mr. Linville succeeds R. D. MCAUSLAND, who has retired. H. C. DAVIS is now a director of operations for recently developed products of Bemis. He was previously manager of paper specialty plants. A. L. PARK, assistant to director of central operations, succeeds Mr. Davis as manager of paper specialty plants.

The Du Pont Company has named ROBERT E. THOMAS JR. office manager for its "Kinetic" chemicals division in the Los Angeles district of its organic chemicals department. Mr. Thomas was previously assistant section manager. SAMUEL N. SEELY is now supervisor of "Kinetic" sales in the Los Angeles district for Du Pont.

New plant manager of Stone Container Corporation's Chicago corrugated box plant is CHARLES CUMBY. Formerly plant manager of Stone's Philadelphia plant, Mr. Cumby fills a vacancy created by the advancement of GEORGE BERLIANT to the new post of assistant general manager.

CARL O. SKOGGARD is now assistant manager for production at the Covington, Virginia, mill of West Virginia Pulp and Paper Company. Formerly, he was superintendent of the pulp mills at Covington. New superintendent is EDWIN K. SCHOLZ, previously assistant superintendent of the pulp mills.

## Which aerosol container?

*(Continued from Page 12)*

plain glass containers, as would be expected, are cheaper than the aluminum, plastic or plastic-coated glass containers. However, pressure limitations, as well as the safety factors, have limited the use of the glass container for aerosol products. Further valve developments which will make ultra-low pressures practicable, and more experience with uncoated glass containers, may change this outlook.

### Weight

Because of shipping cost, weight becomes a factor in aerosol containers. A plastic-coated glass container of four-ounce capacity will weigh more than three times as much as a tinplate container of similar capacity. A plastic container weighs less than a glass container of similar capacity. Because of the low weight of tinplate containers, the use of aluminum would not make a significant weight difference.

### Valve Flexibility

For the metal containers having a standard one-inch opening, there are several valves made by different manufacturers available, including the powder valve. For the glass bottles, however, there are only two valves available at the present time. Other manufacturers are producing glass bottle valves on a experimental basis only. Manufacturers of plastic containers are supplying their own valves with the container as a complete unit, thereby limiting valve selection for these containers.

### Esthetics

Because the aerosol glass bottle, coated and uncoated, can be made both beautiful and shapely, it has met with favor for women's cosmetic products such as colognes and perfumes.

### Flammability

Aerosol products which are classified as flammable by the I.C.C. cannot now be packaged in anything but metal containers.

Despite the variety of aerosol containers available, there is no question of one supplanting another — a definite product seems to be found for each.

## How to address Package Engineering:

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Our classified advertising section is intended for use by those wishing to buy or sell used packaging equipment, to employ packaging personnel, seek such employment, offer or seek business opportunities. It is not available for general advertising. Terms: Cash with order. Rates: Up to 60 words, $10.00. If boxed, $20.00. Up to 120 words, $20.00. If boxed, $40.00. Up to 180 words, $30.00. If boxed, $60.00.

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Packaging engineer wanted by well-known manufacturer with excellent reputation, located in Virginia. Some experience necessary. Salary commensurate with experience. Address reply to Box 301, Package Engineering.

Packaging engineer wanted by Indiana drug and cosmetic manufacturer. To study drug and cosmetic packaging operation and recommend purchase of new equipment. Applicant should have thorough knowledge of automatic packaging equipment. Salary open. Write, giving full details as to present position, education, age, and salary required. Address reply to Box 302, Package Engineering.

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# What we think

Has anyone seen this ad?

> **WANTED:** Man to think about the future of packaging. No assigned duties. No prescribed office hours. Immaterial whether he gets along well with people. Aptitude test scores of no consequence. Not required to attend committee meetings. Major qualification: Ability to think boldly, creatively. Will be judged by how well he fires the imagination of our young men (tomorrow's packaging experts) to strike out for themselves to find new solutions to technical and operational problems, and how well he helps them cut through the maze of conflicting views — to see packaging in its true relation to our company, our industry and our economy generally.

No, we haven't seen it, either, but we wish we would see it—and often. We think it represents a pressing need of our field: More original, creative thinking, resulting in boldly conceived plans, effectively carried out.

One immediate need is the defining of standards, as in working out the educational requirements of a given job, such as packaging engineer. But just doing this involves one in a self-orientation in packaging.

There is a lot of confusion about the nature of the packaging man's job and the place of the packaging function in the corporate structure. It all can become very complex, as when one seeks to define the educational requirements of those who will fill beginning jobs in packaging.

It seems that first you spread out the requirements of the job, its typical tasks, functions and responsibilities. Then, you determine the education and training a man needs to do all that the job calls for. Now, you do two things: First, ascertain how much of this a man should have prior to coming on the job. Second, find out how to fill the gap—between what he knows when he arrives, and what he must know to do the job.

Whether you fill this gap by on-the-job training, additional education such as evening courses, individual programs of study, or simply the guidance of an experienced man, is immaterial. The big point is that before you can do all this, you must know the place of the job in your company packaging organization, the place of that organization in the company as a whole, the place of packaging in your industry generally, and its role in our economy itself.

In cutting through an incredible entanglement of facts, opinions and ideas about these functions and relationships, in order to come up with some standards to follow, one thing becomes very clear: We need original and creative thinking.

Unfortunately, the creative factor is taking quite a beating in many quarters, and not enough voices are rising to its support. Too many people are trying to mechanize and automatize the human mind.

Our personnel experts are doing much to establish the value of aptitude tests as a substitute for purely personal judgment in the selection of men. Parenthetically, we doubt that the growing reliance on these tests is basically a healthy trend for us. In other quarters, brilliant producers of electronic miracles are coming up with almost magical mechanical brains. Our great pioneers of new techniques, like "operations research" and "linear programming" are going far to take the guesswork out of the decisions of men.

But are we on the way to mechanizing and rationalizing ourselves to a point where the mind of the individual just doesn't count? Should we not think about restoring the individual, creative approach to its rightful place, putting more emphasis on individual thinking by our packaging people generally?

Too often, when we want to talk to some packaging man who we know is capable of this kind of thinking, we hear "he's in a meeting". Wouldn't it be well to take our experts out of the meetings and let them get back to work? We wonder if packaging isn't falling into the same deadly trap of conformity to grouplike thinking —which seems to be part of so many other technical and managerial fields.

Perhaps the real problem is that of "who is going to be first" in a return to creative thinking. We know many men capable of doing this kind of thinking, if only their unimaginative superiors would let them. Likewise, we know engineers and executives, at all levels, including top management, who conceive brilliant packaging operations—which fall short because those who must carry them out cannot grasp them. We have no illusions about the difficulties these men face in selling their plans, and in freeing themselves of obstacles to their creative thinking.

But would it not be well to keep the grand plan always in view, to make whatever start we can toward restoring the place of creative thinking and originality in our technical endeavors? The real growth of packaging, the real development of the packaging man, depends not on test scores, machines and mathematical techniques, but on the minds of men.

Bruce Hollingren

Editor

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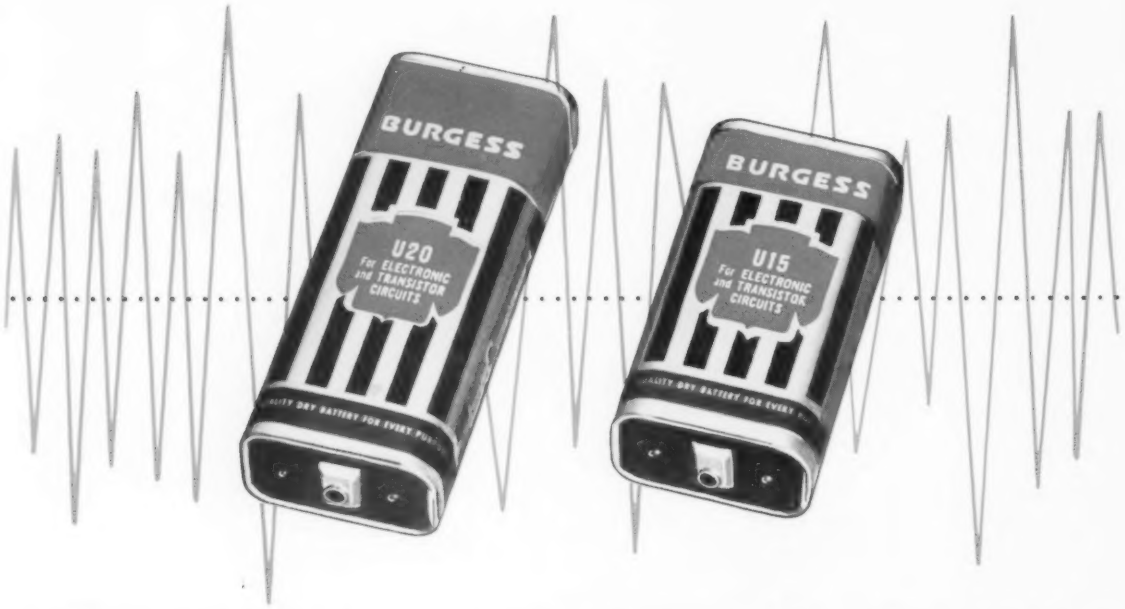


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